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- The first book for targeting NORCET 2023 and NORCET 2024 as per the new exam pattern (prelims & mains).
- Thoroughly revised and updated edition with plenty of new content, synopses, MCQs, CBQs, new subjects, and newly-added booklet section for GK & aptitude.
- Separate section on Decoding the Case scenario-based questions and How to Prepare for NORCET 5.0 (2023) Stage I-Prelims and Stage II-Mains: An Overview.
- Unique amalgamation and integrated approach of subject-wise & topic-wise Theory + MCQs + CBQs + IBQs/VBQs (the complete compendium in ONE).
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Foreword

**Roy K George**  
Sandhya Gupta  
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**Muthuvenkatachalam S**  
**Ambili M Venugopal**

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For Terms & Conditions, kindly refer to AddOn Booklet (Front Inside Cover)

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## About the Authors



### Muthuvenkatachalam Srinivasan

PhD (INC Consortium), MSc (AIIMS), D Pharma, RN (NMBA Australia) is currently working as an Assistant Professor at Institute of Human Behaviour and Allied Sciences (IHBAS), New Delhi. He is former Associate Professor in College of Nursing, All India Institute of Medical Sciences (AIIMS), New Delhi. He obtained Doctorate in Psychiatric Nursing from INC Consortium (in collaboration with RGUHS, Karnataka) in 2017. He is a Postgraduate in Psychiatric Nursing from AIIMS, New Delhi and has also completed a Diploma in Pharmacy. He is also a Registered Nurse with the Nurses and Midwifery Board of Australia. He has published numerous research papers in national and international journals of repute. He is Deputy Editor of Indian Journal of Psychiatric Nursing. He has contributed chapters in textbooks and training manuals of Govt. of India. He is an

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### Ambili M Venugopal

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Read & Practice

Success Rises With Every Question: Practice for Achievement

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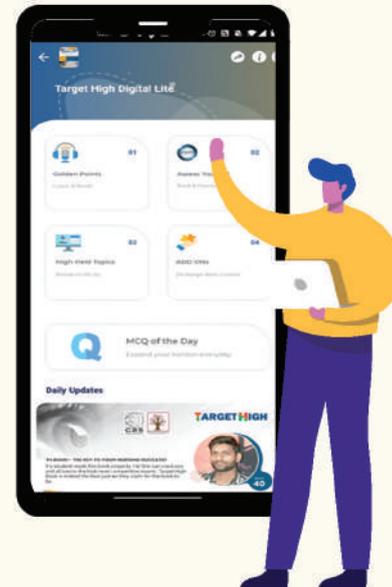
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The Target High Hybrid book is a unique compendium covering all the important subjects needed to excel in your staff nurse entrance exams. The content is well explained. There are ample IBQs and previous year papers in the application and book that will make your learning journey highly efficient.

**Rakesh Kumar Yadav** (Behror, Rajasthan)



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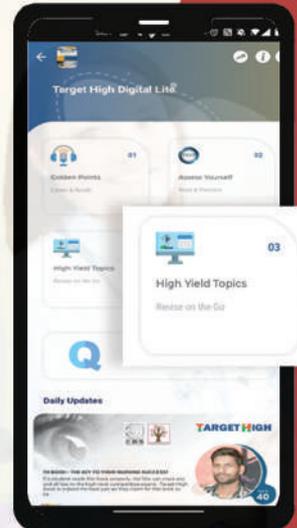
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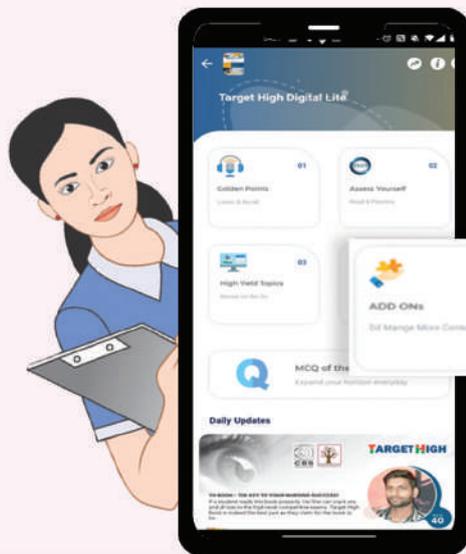
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- **75+** Appendices
- **Study Plan** – Decoding the case scenario-based questions?
- How to prepare for NORCET – Pre & Mains (an overview)
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**Shankar Raj** (Nalanda, Bihar)

### Target High Hybrid book is a broad spectrum of literary work!

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**Kana Ram Maurya** (Nawa, Rajasthan)



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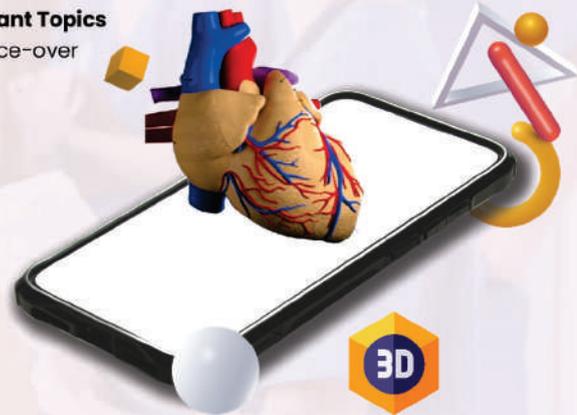


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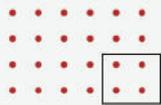
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This book has proved to be the best preparation companion for any and all nursing exams. Target High Digital Lite has updated new features like chapter-wise and subject-wise clinical based MCQs and the clinical highlights between the synopses, which make reading & practicing MCQs more interesting. This book will always keep you updated.

**Zahoor Ahmad Shaikh** (Kulgam, J & K)

### Target High Hybrid Digital edition: Dil Maange More!

I am much of a book reader but once I started studying the Hybrid features of Target High, I could feel the difference. It has described every single topic and subject in a very precise and intricate manner that made my study quite comprehensive for me. Highly recommended for all.

**Shafat Ahmad Naikoo** (Pulwama, J & K)



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**Kana Ram Chotiya** (Jaya, Rajasthan)

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**Shobha Kumari** (Ranchi, Jharkhand)



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*Foreword*

**Roy K George**  
**Sandhya Gupta**  
**Reddemma K**  
**Indarjit Walia**

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- ↳ Ratna Prakash
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## Foreword to 7th Edition

**I**t gives me immense pleasure to introduce this thoroughly Revised and Updated 7th Edition of “Target High: Nursing Entrance Exam Guide.” In this edition, authors have meticulously curated a comprehensive and all-encompassing resource to empower aspiring nursing professionals with the knowledge and skills needed to excel in their journey toward success. With a keen focus on latest developments, all the most recent information, current affairs, programs, policies, and the latest exam patterns up to July 2023 have also been incorporated in this edition.

This book continues to be testament to authors’ commitment of providing the most relevant and up-to-date content for nursing aspirants. With a keen eye toward enhancing your preparation strategy, a separate section has been dedicated to decoding case-scenario based questions, along with insightful guidance on navigating NORCET 5.0 Stage I-Prelims and NORCET Stage II-Mains.

In alignment with the evolving landscape of nursing education, this edition organizes all subjects according to the New Revised INC Curriculum. Furthermore, the authors have expanded the scope of this book by including two new subjects, *Applied Psychology and Sociology*, along with *Forensic Nursing*, ensuring that students are well-prepared for the diverse challenges of the nursing profession.

To facilitate effective learning, an attractive layout that combines theory with previously-asked questions from important exams, including NORCET 2023, 2022, and the latest state-level exams has been followed. Within these pages, you will find more than 1000 important key points, meticulously crafted synopses for Fundamentals of Nursing, Obstetrics and Gynecology, Pediatric Nursing, and Community Health Nursing, and over 1000 illustrative tables, images, flowcharts, and illustrations which will help you in clarifying the concepts.

The digital age demands a strong digital support system so, Target High has been supported with a digital boost having a variety of features. With over 25,000 MCQs, including 500+ new questions, 5,000 MCQs with rationale, 15,000 practice questions, and an array of integrated clinical-based and case-based questions, this edition is a treasure trove of learning and practice opportunities.

As you embark on this transformative journey, authors have rest assured that you have in your hands a comprehensive and powerful tool that has been honed and perfected over time. The inclusion of 116+ previous year papers, 3000+ golden points for last-minute revisions, and a wide array of appendices further solidify the status of edition as a beacon of knowledge and guidance.

I extend my heartfelt gratitude to the authors of this book who have tirelessly worked to bring this edition to fruition, and I wish all nursing aspirants the very best in their pursuit of excellence. May “Target High: Nursing Entrance Exam Guide” be your steadfast companion, guiding you toward success and accomplishment in the dynamic and rewarding field of nursing.



**Prof. (Dr) Roy K George**

National President TNAI  
Member Indian Nursing Council  
Director Academics, Baby Memorial Hospital  
Kozhikode, Kerala

# From Authors' Desk

We extend our heartfelt wishes to you and your loved ones, hoping that you are in good health and navigating the challenges posed by the lingering pandemic with resilience and safety. These past three years have brought about unprecedented trials the global community has borne witness to, a series of unfortunate events. The unwavering dedication of health care professionals has provided us with a beacon of hope and care.

Among these health care heroes, nurses have stood at the forefront, selflessly tending to our well-being, playing a pivotal role in saving lives. Today, we stand united in expressing our deepest gratitude to all nurses and health care workers. As we look forward to the future, it is heartening to envision a collaborative journey ahead, where you will join hands with fellow health care champions.

As we present the 7th Edition of Target High, we extend our profound gratitude to all health care workers and nurses, and readers who have propelled this journey of knowledge and excellence. May this edition serve as a guiding light for all Nursing Officer Aspirants, equipping them with the knowledge and insights needed to excel in their career.

Serving its purpose profitably with 6 successful editions, Target High has now come out with more valuable and informative content. Change is the law of nature and the need of the hour, and with this vision, Target High 7<sup>th</sup> Edition has been thoroughly revised, updated and upgraded in all aspects.

With the motive of **Aim High, Achieve High**, we have changed the motto of Target High from **One Nation, One Book** to **One Nation, One NORCET, One Book**, keeping in mind the changing trends in the examination pattern, giving due importance to the top-level examinations. All the reviewers, contributors and readers have played a pivotal role in making this compendium reach the next level by covering all the required study material that targets Nursing Recruitment Examination held in India and in foreign countries.

In this edition, we have covered synopsis of each and every subject that has been updated and wrapped in an integrated manner by emphasizing the clinical importance and focusing on the futuristic approach of the Nursing Officer Examination. This time two new subjects have been added as per the revised INC Syllabus, i.e., Applied Psychology and Sociology. The whole edition has been thoroughly revised and updated as per the changing examination trends. The text of Target High has been supplemented with a number of **Key Point boxes** that cover important facts, **Points to Remember** boxes that cover Must-Know-Information, **Clinical Corner** that covers all the relevant scenario-based questions, **Practice Questions section** that covers important questions, **Recent Questions** section that covers recently held examinations' questions, like NORCET 2023, NORCET 2022, CNCI 2020 and many more.

Special emphasis has been given to Subject-wise cum Topic-wise Clinical Case-based questions of the core nursing subjects, like Fundamentals of Nursing, Medical Surgical Nursing, Psychiatric Nursing, Obstetrics and Gynecological Nursing and Pediatric Nursing as per the NCLEX examination pattern and recently changed NORCET Exam pattern. Multiple Choice Questions of each subject have also been arranged under various topics in Subject-wise cum Topic-wise manner.

The answers to all the questions have been authenticated from various reference resources and controversial questions have been supplemented with their explanations for doubt clarification. Question banks have been enhanced by adding more exam-oriented questions to give an extensive coverage of questions from all the topics along with Important one-liners at the end of every subject, in a Podcast Format.

New Important and Quick Glance topics have been covered under Appendices. All latest Previous Year Papers up to July 2023 have been added to provide glimpses on the recently held examination in one go. General Knowledge, English, Numerical Ability and Reasoning section have been covered in detail in a separate booklet.

Last but not the least, Target High has come up with the Hybrid Edition this time. The Hybrid Edition is an amalgamation of 'the book and the digital platform'. Readers, can now read theory from the book and practice from the Nursing Next Live App. This integrated approach will help students enhance their comprehension, knowledge and level of practice.

With its meticulously curated content and innovative approach, the Hybrid Edition of Target High serves as a panacea, addressing every facet of your Nursing Exam preparation. It is our fervent hope that you embrace this edition with the same enthusiasm and affection that you have shown for the previous editions.

As you embark on this journey, we encourage you to prepare with utmost diligence and dedication, leaving no stone unturned in your pursuit of excellence. May this edition serve as the catalyst that propels you toward your long-cherished dream job, a culmination of your relentless efforts and aspirations.

**Muthuvenkatachalam Srinivasan**

**Ambili M Venugopal**

# Acknowledgements

## *Thanking the Almighty for His Immense Blessings!!!*

With humility, we acknowledge our indebtedness to all. The task of writing a book and updating the matter in accordance with the changing scenario is harder than we thought and more rewarding than we could have ever imagined. None of this would have been possible without your all-incredible support. We are eternally grateful to all of you for playing a vital role during our struggle and success for the *Target High Sixth Edition*. Now, with the blessing and support from all of you, we are presenting **Target High Seventh Premium Colored Hybrid Edition** with a new look, updated and upgraded content, additional features and digital support as per the need and demand of the time.

From the inception, with profound love, we owe sincere gratitude to our parents, siblings and daughters for their unconditional love, support, understanding and forbearance throughout the ups and downs in the journey of this book.

It is very well said that *a teacher is a great source of knowledge, prosperity and enlightenment by which anybody can be benefited*. Our teachers deserve the credit for the gift of their guidance, invaluable suggestions, constructive criticism and perpetual inspiration, which inspired us in our difficult time, kept us motivated and enabled us to complete this book.

We are forever grateful to our teacher, mentor and a great motivator **Dr Sandhya Gupta**, Formerly-Principal (Actg.) and Associate Professor, College of Nursing, AIIMS, New Delhi, for inspiring us and inculcating confidence into us to write a book. We are indebted to her for the constant support and encouragement in this endeavor. We also want to thank **Dr Latha Venkatesan**, Professor cum Principal, College of Nursing, AIIMS, New Delhi for being a constant support and a mentor.

Words fail to express our gratitude to **Dr Ratna Prakash**, Professor and Academic Director (Former Principal), Pal College of Nursing and Medical Sciences, Haldwani, Uttarakhand for her unconditional support and encouragement on initiating this book. We are fortunate to have her in our path.

We wish to express our heartfelt thanks and regards to all those, who have contributed appropriate and relevant information to this book. Without their cooperation, this endeavor might not have been possible.

These acknowledgments will be incomplete without mentioning the role of our beloved students, who have always been our well-wishers, constant supporters and source of learning and encouragement.

We appreciate the support of **Mr Satish Kumar Jain** (Chairman) and **Mr Varun Jain** (Managing Director), M/s CBS Publishers and Distributors Pvt Ltd for their wholehearted cooperation in publication of this book. We have no words to describe the role, efforts, inputs and initiatives undertaken by **Mr Bhupesh Arora** (Sr. Vice President – Health Sciences Division, Publishing & Marketing), for his endeavor toward the development of the book.

We sincerely thank the entire CBS team for bringing this colorful edition with utmost care and amazing presentation. We would like to thank Ms Nitasha Arora (Publishing Head & Content Strategist – PGMEE & Nursing Division), Ms Daljeet Kaur (Assistant Publishing Manager), Dr Anju Dhir (Product Manager cum Commissioning Editor – Medical), Mr Shivendu Bhushan Pandey (Senior Manager and Team Leader), Mr Ashutosh Pathak (Senior Proofreader cum Team Coordinator) for putting their hard work and efforts to bring out this book on time and all the production team members for devoting laborious hours in designing and typesetting of the book.

Our special thanks are due to entire Sales, Marketing and Tech team—Mr Chiradeep Bose (General Manager–Central Marketing and Sales Offline Unit), Ms Neetu Jindal (Senior Digital Marketing Manager) and Ms Preeti Arora (Tech and Operation Head) for their special contributions in offline & online marketing and strong tech support.

We owe special thanks to all Branch Heads for their contributions toward making the book available throughout India and turning our idea of “**ONE NATION, ONE NORCET, ONE BOOK**” into a reality.

We are also thankful to our colleagues who helped us to formulate ideas when they did not even know that they were helping. Their involvement has triggered and nourished our intellectual maturity. Once again, we express our heartfelt gratitude to the unstinting support given by our friends and everyone in our team.

Finally, we would like to thank everybody who is important to the successful realization of this book and express our apology if we missed anyone’s name, which we assure is completely inadvertent.

# From Publisher's Desk

***Education is the most powerful weapon which you can use to change the world. - Nelson Mandela***

With a firm belief that quality education can change the world, I on behalf of CBS Publishers & Distributors would like to show my gratitude to all the readers of Target High across India. With the huge success of previous editions of Target High, making it the 'Best-Seller', we have come up with the new updated 7<sup>th</sup> edition to provide "Nothing but the Best" for nursing aspirants.

We are delighted to announce that CBS Publishers & Distributors have completed 50 glorious years of publishing. The journey of these 50 years hasn't been easy but phenomenal. Your love and support have helped us to come up with various quality health science books and educational platforms.

Over the past fifty years, the publishing industry has undergone significant changes. Publishers used to be just intermediaries between authors and readers. They didn't actively participate in quality checks or stay up to date with examination trends, which led to users receiving content without proper vetting.

CBS and the Nursing Knowledge Tree division have adapted to the changing scenario and are dedicated to delivering top-notch education. As with huge success comes huge responsibility, we believe Improving the quality of books is imperative to enhance the standard of nursing education and students. And to do so, the approach has always been a thorough quality check at various levels and inputs to/from authors as per the current examination trends.

Target High embarked on its journey in 2016 with the aim of creating a book that is complete in itself aiding the needs of nursing aspirants. I am pleased to share that we have undoubtedly accomplished our vision over the past six years. More than 3,00,000 Students nursing aspirants have read and referred to Target High with a belief that it has played a significant role in their success.

Every single word of this edition has been meticulously analyzed by experts to meet the highest standards of authenticity and credibility. The goal has always been to create an unparalleled source of information for nursing aspirants, one that is flawless and complete. The journey which started with just one book has come a long way with a series of Target High books

1. Target High NEXT - Nursing Decode for Nursing Undergraduate 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year
2. Target High CHO Entrance
3. Target High MSc Entrance
4. Target High Kerala PSC Entrance
5. Target High Digital Lite (App)
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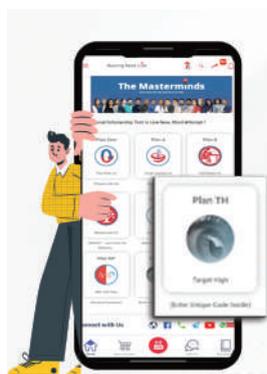
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6. Uttar Pradesh University of Medical Sciences (NO) 2023 (NEW)
7. NORCET (NO) 2022 (Memory Based) (NEW)
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10. Odisha Subordinate Staff Selection Commission (NO) 2022 (NEW)
11. Gujarat Nursing Service 2022 (Nursing Officer/Principal) (NEW)
12. NORCET (NO) 2021 (Memory Based) (NEW)
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38. AIIMS Raipur (Senior Nursing Officer) 2017
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71. UK State MSc (Nursing Officer) 2016
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82. RRB Secunderabad (Senior Nursing Officer) 2015
83. RRB (Nursing Officer) 2012
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85. HP (Nursing Officer) 2016
86. RAK MSc Entrance Exam 2018
87. RAK New Delhi Entrance Exam 2017
88. GMCH (Nursing Officer) 2019
89. GMCH (Nursing Officer) 2016
91. Northern Coal Field Limited, Singrauli (Nursing Officer) 2019
92. PGIMER Chandigarh (Nursing Officer) 2016
93. CHO Haryana 2021
94. CHO Rajasthan 2020
95. CHO Madhya Pradesh 2020
96. CHO Madhya Pradesh 2019 Shift-1
97. CHO Uttar Pradesh 2018
98. RUHS MSc Nursing Entrance Exam 2018
99. RUHS MSc Nursing Entrance Exam 2016
100. RUHS Post Basic Basic Nursing Entrance Exam 2016
101. LNJP Hospital Delhi (Nursing Officer) 2012
102. DSSSB Shift I (NO) 2019
103. DSSSB Shift II (NO) 2019
104. DSSSB PHN 2015
105. DSSSB ANM 2015
106. Jhalawar Hospital and Medical College Society 2012
107. TNPSC Maternal and Child Health Officer 2015
108. RML Hospital (Nursing Officer) 2011
109. Insurance Medical Services (Nursing Officer) 2004
110. RRC (Nursing Officer) 2012
111. SCTIMST (Nursing Officer) 2015
112. Rohtak (Nursing Officer) 2020
113. NIMHANS (Nursing Officer) 2019 (Memory Based)
114. SKIM (Nursing Officer) 2020 Paper
115. Gujarat Staff (Nursing Officer) 2021
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# How to Prepare for NORCET (Prelims and Mains): An Overview

The recent changes in NORCET exam pattern have brought two stages of exams: Stage I – NORCET Preliminary and Stage II- NORCET Mains.

**NORCET examination will be conducted in two successive stages as described below:**

**Stage I:** NORCET Preliminary

**Stage II:** NORCET Mains

The overview of NORCET new pattern and how TARGET HIGH can be effectively used for preparation is illustrated below.

	Stage I- NORCET Prelims	Stage II- NORCET Mains
Exam pattern	<ul style="list-style-type: none"> <li>• 100 MCQs – 100 marks</li> <li>• 80 Questions from nursing subjects at BSc nursing level</li> <li>• 20 Questions from GK &amp; Aptitude.</li> <li>• Computer-based test</li> </ul>	<ul style="list-style-type: none"> <li>• 100 MCQs – 100 marks</li> <li>• Case scenario-based questions</li> <li>• Nursing skill related questions</li> <li>• Computer-based test</li> </ul>
Time duration	90 mins	90 mins
Negative marking	1/3 per wrong answer. (-0.33 per wrong answer)	1/3 per wrong answer. (-0.33 per wrong answer)
Scheme of exam	<p><b>Qualifying in nature</b></p> <ul style="list-style-type: none"> <li>• 50% for UR/EWS</li> <li>• 45% for OBC</li> <li>• 40% for SC &amp; ST</li> <li>• Additional 5% relaxation for PWBD</li> </ul> <p>However, NOT all eligible candidates will be called (shortlisted) for Stage-II exam.</p> <p>Only 5 times the total seats in each category (UR, OBC, SC, ST, EWS) will be shortlisted to write Stage-II-Mains exam.</p> <p>For example, if the vacancy position is UR-100, OBC-25, SC-15, ST-7, &amp; EWS-10), then the number of candidates shortlisted will be UR-500, OBC-125, SC-75, ST-35 &amp; EWS-50.</p> <p>The qualified candidates who are in tie with the last shortlisted candidates also will be called for Stage-II exam.</p> <p>All qualified PWBD candidates will be called for Stage-II exam.</p>	<p>The qualifying marks in the Stage-II, NORCET Mains Examination will be:</p> <ul style="list-style-type: none"> <li>• 50% for UR/EWS</li> <li>• 45% for OBC</li> <li>• 40% for SC &amp; ST.</li> <li>• Additional 5% relaxation for PWBD</li> </ul> <p>Merit rank list shall be prepared based on performance in CBT as per qualifying criteria in Stage-II NORCET Mains.</p>
Difficulty level	Easy to moderate	Moderate to difficult
How to prepare using TARGET HIGH	<p><b>Theory:</b></p> <ul style="list-style-type: none"> <li>• Synopses in the 7<sup>th</sup> edition is thoroughly revised, particularly the FON to enhance knowledge in basic nursing procedures and concepts.</li> <li>• All the subjects as per the new INC syllabus have been included.</li> <li>• Focus on reading the synopses of all subjects.</li> <li>• Give attention to Key points, Practice questions and Questions from recent NORCET exams provided side-by-side in the synopsis for better understanding.</li> <li>• Read, revise and reinforce the Golden Points given at the end of each synopsis. Those golden points are high yield points which are more likely to be asked in the Stage-I Prelims.</li> <li>• <b>GK &amp; Aptitude:</b> Keeping in mind the 20% weightage, the GK &amp; Aptitude content is improved and enriched with all recent updates, verbal and numerical reasonings, quantitative aptitude, etc. Most importantly, the GK &amp; Aptitude section is provided as a separate booklet.</li> </ul>	<p><b>Theory:</b></p> <ul style="list-style-type: none"> <li>• Case scenario-based questions (CBQs) and Nursing Skill based questions are the only focus in the Stage II-Mains exam.</li> <li>• They provide a strong foundation in disease conditions, signs and symptoms, physiological parameters, pharmacology, drug effects, and pathophysiology which are crucial for solving these questions effectively.</li> <li>• Target High 7th Edition contains comprehensive information on these concepts, particularly in the synopsis part. The synopsis part also includes Case scenario-based questions side-by-side.</li> <li>• The inclusion of 1000+ Case scenario-based questions with rationales in the book's various sections is seen as a valuable tool for test-takers to practice and enhance their understanding.</li> <li>• Practicing these Case scenario-based questions can indeed be a beneficial strategy to refine and improve one's knowledge and problem-solving skills for the exam.</li> </ul>
How to boost preparation using TARGET HIGH Digital Lite	<ul style="list-style-type: none"> <li>• You can prepare on the go with the Target High Digital Lite App.</li> <li>• All the Target High readers are free to use this feature.</li> <li>• Subject wise tests and Grand tests as per the recent pattern are provided from time to time.</li> <li>• Voice over of Golden points can heard on the move. This will reinforce your memory of important key points.</li> </ul>	<ul style="list-style-type: none"> <li>• Review and Practice additional Case scenario-based questions provided in the App to boost your preparation.</li> <li>• Take Grand tests on the NORCET Mains pattern in the App.</li> </ul>

# Decoding the Case Scenario-based Questions

## INTRODUCTION

Decoding the scenario-based clinical multiple-choice questions (MCQs) in nursing requires a systematic and strategic approach. Such questions assess a nurse's ability to apply clinical knowledge, critical thinking, and clinical judgment in various patient situations. To navigate these questions effectively, a step-by-step strategy can be employed.

This strategy involves a detailed 5-Points approach which is as follows:

1. Analyzing the question stem and options
2. Prioritizing nursing actions or interventions
3. Categories of case scenario-based questions
4. Normal vs abnormal and nursing action vs physician action
5. Answering complex case scenario-based questions using clinical judgment

Each of these approaches has been discussed in detail with suitable examples:

## ANALYSING THE QUESTION STEM AND OPTIONS

- The Scenario-based MCQs will have two parts. The stem and the four options, out of which one option would be correct. Options other than the correct answer are known as distractors.
- The goal of these scenario-based MCQs is to assess the nurse's ability to apply knowledge, clinical reasoning, and critical thinking skills to make the best decision in a given patient situation.
- As a test-taker, it is crucial to carefully read and analyze both the stem and the options before selecting the most appropriate response based on your nursing knowledge and judgment.

### The Stem

- **Stem provides the context** and information about the patient or clinical situation.
- **Understanding the stem** and identifying the key terms or strategic terms is very important to answer the question.
- **Read the stem carefully:** Start by reading the stem carefully and pay close attention to the patient's condition, symptoms, vital signs, and any other relevant information.
- **Stem usually has two parts:** 1. *Scenario/Event:* The case scenario for which a nurse is caring for. 2. *Query:* What the nurse is expected to do (nursing action).
- **Identify the main issue:** Determine the main problem or issue that the question is addressing. It could be:
  - a specific symptom
  - a change in vital signs
  - a complication, or
  - a potential risk to the patient.

**Note:** Considering the time limit (one minute per question), it is very important to read quickly and carefully to understand the key term or strategic term.

- **Look for quantitative information:** Keep an eye out for specific numerical data, such as vital signs, laboratory values, or medication doses. These values can be essential in identifying abnormal findings or trends.
- **Note qualitative descriptions:** Look for descriptive terms or adjectives that provide clues about the severity or character of the patient's condition. For example, words like "severe," "acute," "mild," "chronic," "sudden," or "gradual" can impact the urgency of the response.
- **Recognize key terms or strategic terms:** Recognize key terms or phrases which guide you to choose the correct answer. The key terms include: **first, initial, best, essential, priority, immediately, early, late, most appropriate, inappropriate, EXCLUDE, INCLUDE, increased, decreased.**
- **Positive vs negative stem:** Look for key word to determine whether the stem is positive or negative.
  - **Positive terms:** Positive terms in the stem include **Appropriate, True, Indicated** and **Understand**. For example, which statement **best** represents how the nurse should document these findings? In this case, you should be looking for a positive response (appropriate or right method) from the options.
  - **Negative terms:** Negative terms in the stem include **Not, Never, further (...further education or intervention required), Least, Avoid, Contraindicated**. For example, which intervention should be given the **least** priority in this case? In this case, you should be looking for least important intervention (or inappropriate or unsuitable intervention) from the options.

### Example Question

#### Positive Stem

During the discharge process of a 12-year-old child with hemophilia, the nurse advises the parents regarding the **most appropriate** sport activity for the child. What sport activity does the nurse recommend?

- a. Swimming   b. Football   c. Field hockey   d. Basketball

#### Ans. (a) Swimming

**Explanation:** Hemophilia is a bleeding disorder characterized by a deficiency or dysfunction of clotting factors in the blood. Therefore, high-impact or contact sports should generally be avoided to minimize the risk of bleeding and injury. With that in mind, the nurse should recommend low-impact and non-contact sports. So, among the given options most appropriate sport activity for the child is swimming.

**STRATEGY:** The key word **Most appropriate** leads to a positive or suitable or appropriate sports activity for the child with hemophilia.

**Example Question****Negative Stem**

Nurse Ramya, a palliative care nurse, is providing nursing care to a terminally ill patient during the dying and grieving process. She is aware that the **least important** goal of nursing intervention in this client is:

- Providing comfort measures
- Promotion of rest and sleep
- Increase self-esteem through cosmetic improvement
- Pain management

**Ans. (c) Increase self-esteem through cosmetic improvement**

**Explanation:** The nursing interventions should target pain management through pain-reduction techniques and analgesia, providing comfort measures, promotion of sleep and rest, and energy conservation for this patient. Though dying with dignity and self-esteem is important, increase of self-esteem through cosmetic improvement is not important for this client.

**STRATEGY:** The negative key term “least important” leads to choose the unimportant interventions among given options.

**ALERT**

**Double negatives in the stem:** While using the key word strategy, please be cautious about double negatives in the stem. If the stem has two negative terms, then you should be looking for positive response. For example, Stem: all of the following interventions are **contraindicated** in a patient with diabetes mellitus, **except**. In this stem, there are two negative key words; ‘contraindicated’ and ‘except’ which guide you to choose the positive or suitable intervention.

**Example Question****Double Negatives**

A 45-year-old patient has recently undergone a colostomy surgery. The nurse is providing dietary education to the patient. The nurse advises the patient **to avoid** the following foods to ensure optimal recovery, **except**:

- Consume high-fiber diet
- Encourage raw vegetables
- Encourage intake of legumes
- Encourage cereals made from refined flour

**Ans. (d) Encourage cereals made from refined flour**

**Explanation:** The question is asking for the food that the nurse should not advise the patient to avoid. Cereals made from refined flour are low in fiber and easy to digest, so they are not a concern after a colostomy surgery. The other answer choices are all foods that are high in fiber and should be avoided after a colostomy surgery.

**STRATEGY:** Identify the double negative terms in the stem; ‘to avoid’ and ‘except’. This leads you to choose the appropriate or suitable diet for the patient with colostomy.

- **Pay Attention to time frames:** If time-related information is provided in the stem, consider how it might influence your response. For instance, the urgency of the intervention might differ between immediate actions and actions that can be taken later. On the other hand, time frame is important in deciding what is the appropriate action/intervention to be taken.

**Example Question****Time Frame**

A 2-year-old child weighing about 35 kg was brought to the emergency department **30 minutes** after accidental ingestion of 12 tablets of Paracetamol 650 mg. Which of the following intervention is the priority for this child?

- Administer N-Acetylcysteine
- Administer activated charcoal
- Perform gastric lavage
- Administer 5% dextrose in half normal saline

**Ans. (b) Administer activated charcoal**

**Explanation:** Treatment guidelines for oral Paracetamol (acetaminophen) ingestion in children:

- Less than 4 hours after ingestion – Consider activated charcoal if dose is >150 mg/kg (activated charcoal is not advised if the ingested dose is unknown)
- 4–24 hours – Obtain plasma acetaminophen level as soon as possible. Start with N-Acetylcysteine (NAC) administration.
- Longer than 24 hours – NAC administration

**STRATEGY:** Time-related information is key to solve this question. Time frame 30 minutes (<4 hours) is the key factor for the treatment option. If time frame exceeded 4 hours, the answer would be a. Administer N-Acetylcysteine.

**Options**

By following the previous steps, you have read the stem carefully and understood the client conditions, and parameters, and identified the key terms. Now, you read the options carefully and try to match:

- Positive key terms with positive options (appropriate or suitable interventions)
- Negative key terms with negative options (inappropriate or non-suitable interventions)
- Double negative key terms with a positive options (appropriate or suitable interventions)

**Note:** The examples for these 3 scenarios were given earlier in this chapter.

Identify words or phrases in the options that have strong connection or similarity to words in the stem. Sometimes, the words in the options may be closely linked but not identical.

**Example Question****Connection Words**

A patient develops anaphylactic reaction to an IV medication, which of the following should be the **immediate** response of a nurse?

- Call for emergency help
- Stop the medication administration immediately
- Administer IM Epinephrine
- Start CPR

**Ans. (b) Stop the medication administration immediately**

**Explanation:** The immediate response of the nurse should be removing the allergen (stopping IV medication in this case). The next step is to call rapid response and start basic life support (BLS/CPR) until the help arrives.

**STRATEGY:** Look for connection word ‘immediately’ in the stem and the option which guides the test-taker to option b.

# ? Video-Based Questions (VBQs)



Watch these  
**VIDEOS** in  
**TARGET HIGH** Digital Lite

1. Which of the following procedure is being performed in the video?



- a. Ortolani and Barlow test
- b. Anterior drawer test
- c. Lachman test
- d. Flexion rotation drawer test

5. The procedure being performed in the video is:



- a. Pulmonary function test
- b. Incentive spirometry
- c. Alcohol breath test
- d. Urea breath test

2. Which of the following procedure is being performed in the video?



- a. NG tube insertion
- b. OG tube insertion
- c. Sengstaken-Blakemore tube insertion
- d. Guedel's airway insertion

6. The nasal clip used during the procedure shown in the video is to:



- a. Avoid drainage of nasal secretion during the procedure
- b. Achieve a tight seal of the airway
- c. Improve patient comfort during the procedure
- d. Prevent sneezing during procedure

3. All among the following are the advantage of the procedure shown in the video; EXCEPT:



- a. Minimize aerosol generation
- b. Less chance for cross infection
- c. Apply negative pressure throughout the respiratory cycle
- d. Maintain PEEP throughout the respiratory cycle

7. The device shown in the video is:



- a. Jet nebulizer
- b. Mask nebulizer
- c. Ultrasonic nebulizer
- d. Steam inhalation device

4. The specimen collection shown in the videos is for:



- a. RT-PCR
- b. Rapid antigen test for COVID
- c. Sputum culture and sensitivity test
- d. Both a & b

8. The instrument used for the measurement of Mid-Upper Arm Circumference shown in the video is:



- a. Shakir tape
- b. Stadiometer
- c. Edtape
- d. Gulick tape



**Ans.**

- 1. a
- 2. b
- 3. c
- 4. d
- 5. a
- 6. b
- 7. c
- 8. a

# Appendices



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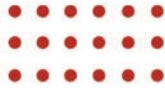
## APPENDICES COVERED (in Book)

1. Updates on Tuberculosis
2. Decontamination of Equipment and Unit
3. Some Disease Conditions and their Primary Signs/Symptoms
4. Instruments
5. Equipment/Instruments
6. Obstetrics and Gynecological Instruments
7. Tubes and Catheters
8. Recent Updates on Community Health Nursing
9. Demography of India
10. Review of Health Programs in India, Launch Year and Objectives
11. Vitamins: Functions, Sources and Deficiency Diseases
12. Health Planning in India
13. Frye's ABCDE Cascade for Prioritizing Care
14. Triage Categories
15. Arterial Blood Gas
16. Shocks: Types, Management and Solutions
17. ECG Waveforms and Pathological Findings
18. Common Scales used for Assessment/Treatment
19. Level of Spinal Cord Injury and Associated Motor Loss
20. Some Important Social Welfare/Health/Development Program Launched by Government of India from August 2014 till June 2023 (New)
21. Cold Chain Methods and Equipment

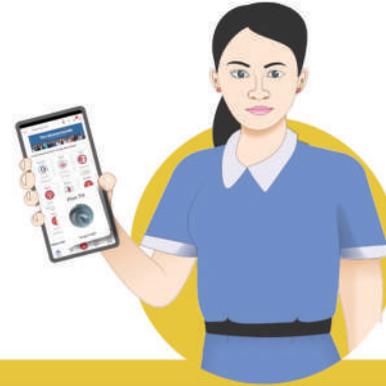
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1. Updates on COVID-19 (New)
2. Management of COVID-19 in Pregnancy (New)
3. Mucormycosis (Black Fungus) (New)
4. Updates on Tuberculosis (New)
5. Updated Questions on COVID-19
6. Slings and Splints
7. Decontamination of Equipment and Unit
8. Some Disease Conditions and their Primary Signs/Symptoms
9. Fetal Circulation and its Postnatal Changes
10. Positions
11. Instruments
12. Equipment/Instruments
13. Obstetrics and Gynecological Instruments
14. Tubes and Catheters
15. Recent Updates on Community Health Nursing
16. Norms for Health Personnel/Centers in Community
17. Cold Chain Methods and Equipment
18. Demography in India
19. Review of Health Programs in India, Launch Year and Objectives
20. Vitamins: Functions, Sources and Deficiency Diseases
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23. Triage Categories
24. Arterial Blood Gas
25. Shocks: Types, Management and Solutions
26. Skeletal and Skin Traction
27. ECG Waveforms and Pathological Findings
28. Biomedical Waste Management Rules 2016
29. Common Scales used for Assessment/Treatment
30. Level of Spinal Cord Injury and Associated Motor Loss
31. Neurotransmitters' Chart
32. Interpretation of BMI
33. Positions and Presentations of Fetus during Labor
34. Some Important Social Welfare/Health/Development Programs Launched by Govt. of India from August 2014 Till June 2023
35. Conversion from Celsius ( $^{\circ}\text{C}$ ) to Fahrenheit ( $^{\circ}\text{F}$ )
36. Quadrants of Abdomen
37. Fetal Skull
38. Cranial Nerves, their Types and Functions
39. Types of Joints in Human Body
40. Functions of Sympathetic and Parasympathetic Nervous System
41. Normal Values
42. Communicable Diseases
43. Levels of Prevention
44. Vaccines used to Prevent Diseases
45. Immunization Schedule
46. Community Nutrition Program
47. Types of Insulin
48. Glasgow Coma Scale
49. Lung Volumes and Capacities
50. Immunoglobulins and their Characteristics
51. Drugs and their Actions
52. Growth and Development
53. Comparison of Components for Adults, Children, and Infants BLS/CPR
54. Stages of Personality Development
55. EGO Defense Mechanisms with Examples
56. Phases of Wound Healing Process
57. Classification of Mental Retardation
58. Phobias
59. Blood Groups
60. Specific Antidotes against Poisoning
61. Drug Storage Temperature
62. Leopold's Maneuver
63. Abbreviations
64. Sequence of Donning and Doffing of PPE while Caring for COVID-19 Patients
65. Blood Supply of Heart
66. Lobes of Brain and their Functions
67. Color Coding for Medical Gas Cylinders
68. Acts and Legislations
69. Radiating Pain/Referred Pain
70. Endocrine Glands and Hormones
71. Acute Coronary syndromes and their Treatment
72. Burns





**“All healing is first a healing of the heart.”**  
—Carl Townsend

## UPDATES ON TUBERCULOSIS

- In 2020, the RNTCP was renamed the National Tuberculosis Elimination Program (NTEP) to emphasize the aim of the Government of India to eliminate **TB in India** by 2025.
- Prime Minister of India launched TB Free India campaign at ‘Delhi End TB Summit’ on 13<sup>th</sup> March, 2018
- India has committed to **End TB by 2025**, 5 years ahead of the global SDG target
- Estimated Incidence of Tuberculosis in 2019 is **26.9 lakh TB cases (199/lakh population)**
- Updates on Lab test**
  - Nucleic acid amplification tests (NAATs) have been used as a **diagnostic tool for tuberculosis (TB)**
  - Cartridge-based nucleic-acid amplification test (CB NAAT)** is the preferred first diagnostic test in children, extrapulmonary TB, contact of Drug resistant TB patients, Smear Negative Chest X-ray positive patients.
- Sample collection (sputum) and transportation to be in falcon tubes in cold chain (quantity – minimum 5 mL)**



Falcon tube

### Treatment of Drug Sensitive TB

Type of TB case	Treatment Regimen Intensive Phase (IP)	Treatment Regimen in Continuation Phase (CP)
<b>New OR Previously treated</b>	(2) HRZE	(4) HRE
<ul style="list-style-type: none"> <li>The drugs are given daily</li> <li>The doses of drugs are according to body weight</li> <li>Fixed Dose Combination (FDC) tablets are used</li> <li>No need for extension of IP</li> <li>CP may be extended by 12–24 weeks in certain forms of TB like CNS TB, Skeletal TB, Disseminated TB, etc.</li> </ul>		

### Treatment of TB-Adult

Weight category	Number of tablets (FDCs)	
	Intensive phase (2 months)	Continuation phase (4 months)
	Combined dose: [H (75 mg), R (150 mg), Z (400 mg), E (275 mg)]	
25–34 kg	2	2
35–49 kg	3	3
50–64 kg	4	4
65–75 kg	5	5
≥75	6	6

**Note:** If patient gains or loses weight, the dose has to be adjusted accordingly during the course.

### Nikshay Poshan Yojana

- ₹500 at the beginning of each month for every notified TB patient for the full treatment period
- Direct Benefit Transfer only

# 2

**“Children have more need of role model than of critics.”**

—Joseph Jonbert

## DECONTAMINATION OF EQUIPMENT AND UNIT

### Strengths of Chemical and their Actions on Equipment and Supplies

Chemical	Strength	Types of instruments	Action and time
Glutaraldehyde	2%	Spirometry tubing Dialyzer Reuse of laparoscopic instrument Rubber instruments or plastic	High level disinfectant for medical equipment such as endoscope 10–20 minutes
Isopropyl alcohol	70%	All metal instruments Scope lenses Ambu bag and its face mask Thermometer probes Clinical glass thermometer Trolley tops Electric razors	Disinfection of articles in 10 minutes
Sodium hypochlorite	0.5% (Add 500 mL of 1% sodium hypochlorite in 500 mL of boiled water to make total quantity of 1 L)	All types of metal, glass, plastic and rubber items scope lenses	Decontamination, disinfection of articles in 10 minutes Fresh solution to be prepared daily
Chlorhexidine gluconate	Add 100 mL 0.5% solution in 900 mL of boiled water to make 1 L	Bedpans Furniture	Disinfection in 10 minutes
Clean solution of phenol	2%	All metal instruments Toughened plastics Glass Delicate items Tubing	Sterilization in 12 hours at room temperature of 20°C
Formalin	7 gm per cubic meter	All metal instruments Toughened plastics Glass Delicate items Tubing	Disinfection in 10 minutes
Savlon	5% pure solution	Cheatle forceps Clinical glass Thermometer Furniture instruments	Disinfection in 20 minutes

### Cleaning, Disinfection of Various Items

Procedure	Rationale	Scientific principle
<b>Glass items:</b> Disinfect the items by immersing in 0.5% chlorine/sodium hypochlorite Chlorhexidine solution minimum for 5 minutes in plastic container covered with lids.	To decrease the number of microorganisms on the surface of the items	Chlorine kills many microorganisms by releasing free oxygen
<b>Enamel wares:</b> Immerse the items in a chlorine solution of 0.5%.	To disinfect	Disinfection can kill most of the bacteria and viruses like hepatitis B virus (HBV), human immunodeficiency virus (HIV), (microbiology)
<b>Stainless steel items:</b> Always immerse in 0.5% of chlorine solution for five minutes.	To disinfect	Disinfection destroys many of the pathogens

Contd...





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Section

**A**

## Subject-wise Synopsis CBQs, IBQs & MCQs

### SUBJECTS COVERED

- Fundamentals of Nursing
- Medical Surgical Nursing/Adult Health Nursing
- Pharmacology
- Community Health Nursing
- Psychiatric Nursing
- Pediatric Nursing
- Obstetric and Gynecological Nursing
- Applied Microbiology
- Applied Biochemistry and Nutrition
- Applied Sociology and Psychology
- Nursing Research and Statistics
- Nursing Education
- Nursing Administration and Management
- Computer/Health and Nursing Informatics
- Forensic Nursing and Indian laws

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Get Your Study Assessed with AMLI

Subjects	MCQs Tests		IBQs Tests		Total Tests
	No. of Tests	No. of Qs	No. of Tests	No. of Qs	
Fundamentals of Nursing	8	800	2	40	10
Medical Surgical Nursing/Adult Health Nursing	6	600	1	30	7
Pharmacology	6	600	2	20	8
Community Health Nursing	8	800	2	40	10
Psychiatric Nursing	4	1200	2	30	6
Pediatric Nursing	8	800	1	20	9
Obstetric and Gynecological Nursing	8	800	2	40	10
Applied Microbiology	2	150	-	-	2
Applied Biochemistry and Nutrition	4	350	-	-	4
Applied Sociology and Psychology	1	20	-	-	1
Nursing Research and Statistics	3	200	-	-	3
Nursing Education	3	150	-	-	3
Nursing Administration and Management	3	150	-	-	3
Computer/Health and Nursing Informatics	2	100	-	-	2
Forensic Nursing and Indian laws	1	20	-	-	1
GK	3	160	-	-	3
<b>Total</b>	<b>70</b>	<b>6900</b>	<b>12</b>	<b>220</b>	<b>82</b>

**80+** Tests (Subject-wise Tests & IBQs Tests)  
Covering **7500+** Questions

“One day in perfect health is much.”

—Arabic proverb

## CHAPTER

# 1

# FUNDAMENTALS OF NURSING



## SYNOPSIS

- The term “nursing” has been derived from a Latin word “nurtix” which means to nourish.
- Definition of nursing by Virginia Henderson—“The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge.”
- Definition of nursing by the American Nurses Association (ANA)—“protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations.”

### FLORENCE NIGHTINGALE'S CONTRIBUTION TO NURSING

- Florence Nightingale was born in Florence, Italy on May 12, 1820 and died on August 13, 1910.
- Every year, International Nurses Day is celebrated on 12th May.
- She developed first organized nursing program for nurses in the year 1860.
- She started her program in the Nightingale Training School for Nurses at St. Thomas' Hospital in London.
- She volunteered herself during Crimean War in the year 1853.
- She is known as “**Lady with the Lamp**” for taking care of soldiers with lamp at night.

### MILESTONES OF NURSING IN INDIA

1871	The first school of nursing with 4 students was started in Government General Hospital, Madras (now Chennai) with 6 months Diploma in Midwives' Program.
1908	Trained Nurses' Association of India (TNAI) was formed.
1926	Madras state (now Tamil Nadu) formed first registration council to provide basic standards in education and training.
1946	The first four years' bachelor's degree program was established at RAK College of Nursing in New Delhi and Christian Medical College, Vellore, Tamil Nadu
1947	The Indian Nursing Council Act was passed by ordinance on December 31.
1948	Nursing Council Act came into existence in 1948 to constitute a council of nurses.
1949	The Indian Nursing Council constituted under the Indian Nursing Council Act, 1947.
1959	First master's nursing course of 2 years duration started at RAK College of Nursing, New Delhi.
1986	MPhil in Nursing was started by RAK College of Nursing, Delhi.
1992	Doctoral program in nursing was started by RAK CON under Department of Nursing, University of Delhi.
2017	Indian Nursing Council launched nurse practitioner in critical care nursing program.
2023	The National Nursing and Midwifery Commission Bill 2023 (NNMC 2023) was passed in Lok Sabha on July 28. NNMC was passed in Rajya Sabha on 08 August 2023.



### KEY POINTS

- Florence Nightingale defined nursing as “**the art of utilizing the environment of patients to assist them in their recovery.**”
- **Environment** is the focus of nursing care in Nightingale's theory.
- A profession requires an extended education/training of its members as well as a basic foundation.



### KEY POINTS

- Principles of nursing:** Safety, therapeutic effectiveness, comfort, resource utilization and good workmanship
- characteristics of a profession:**
- Profession has a theoretical body of knowledge leading to defined skills and abilities.
  - A profession provides a specific service.

## BASIC CHARACTERISTICS OF A PROFESSION

- Specialized education
- Body of knowledge
- Continuous research activity
- Service orientation
- Code of professional ethics
- Autonomy
- Professional organization

## DIFFERENT ROLES OF NURSES

**Table 1:** Role of nurses

Role	Description
Autonomy and accountability	Nurse should be able to initiate independent nursing action without medical orders within the scope of practice. E.g., initiation of cold sponging to a client with fever. Nurse is always responsible and answerable for the quality of care provided to the client.
Caregiver	Caregiver helps the client to achieve maximum level of functioning independently by providing good care.
Advocate	Nurse acts as an advocate to client by protecting client's rights.
Educator	Nurse educates the client about the disease process and its management. Nurse demonstrates and educates clients on health-related activities and promotes healthy lifestyle.
Communicator	It's an integral part of a good relationship. Nurse communicates to the client about disease process, its management and progress.
Manager	Nurse managers are responsible for managing nurses within a healthcare environment and are responsible for creating an environment that promotes a culture aimed at enhancing the quality of life for patients.

## TRENDS IN NURSING

**Table 2:** Trends in nursing

Trend	Description
Evidence-based practice	To provide high-quality nursing care through evidence-based practice.
Quality and safety education for nurses	Provide regular education to stay updated with health care changes.
New technologies	Emerging technologies that contribute to sophisticated diagnostic and treatment modalities, development of e-health and tele medicine, etc.
Genomics	It is the study of inheritance and nurse should use these study findings ethically and for the upliftment of the mankind.
Public perception of nursing	Nowadays, public is aware about the consumer rights and rights of a patient. Always provide high-quality competent care to the client to avoid medical errors.

## NURSING PROGRAMS IN INDIA

**Table 3:** Nursing programs in India

Name of the program	Duration	Basic qualification
Auxiliary Nurse Midwife	18 months and 6 months internship	10+2
GNM	3 years and 6 months	10+2
BSc Nursing	4 years	10+2 Science
Post Basic Nursing	2 years	GNM
MSc Nursing & Nurse Practitioner in Critical Care (NPCC)	2 years	BSc Nursing or Post Basic Nursing with 1 year of experience (INC criteria) NOTE: AIIMS Institutes does not require 1 year experience.



### KEY POINTS

- **Nurse as a Client Advocate:** Defends the client's right to be treated equally without any harm intentionally or unintentionally.
- **Nurse Researcher:** Investigates the role of nurses which further improves the nursing practice.



### Clinical Corner

#### CASE SCENARIO 1:

A nurse is caring for a patient who has been diagnosed with a serious medical condition that requires immediate treatment. However, the patient is refusing to undergo the recommended treatment. The patient's family insists the nurse to persuade the patient to accept the treatment. What should the nurse do?

- The nurse should attempt to convince the patient to accept treatment.
- The nurse should take legal action through court to force the patient to accept treatment.
- The nurse should discuss with another registered nurse to decide further course of action.
- The nurse should respect the patient's autonomy and allow him to refuse treatment.

**Ans. (d)** The nurse should respect the patient's autonomy and allow him to refuse treatment.

Contd...

Name of the program	Duration	Basic qualification
MPhil Nursing	1 year course for regular candidate and 2 year course for part-time candidate	MSc in nursing (NOTE: M.Phil course is abolished as per new NEP)
PhD Nursing	3 years—full time 5 years—part time	<ul style="list-style-type: none"> <li>MSc Nursing is essential qualification.</li> <li>3 years of experience after MSc Nursing for National Consortium for PhD in Nursing.</li> <li>Other Universities have their own criteria but MSc Nursing is essential.</li> </ul>

## ETHICS IN NURSING

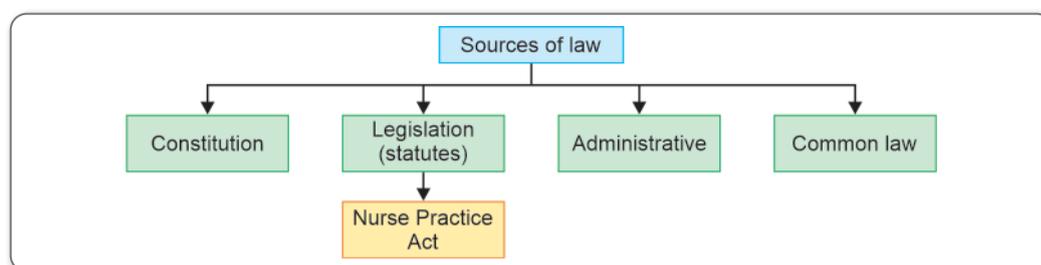
**Table 4:** Ethics in nursing

Ethical principle	Definition	Example
Autonomy	Respecting and supporting others' decisions	Respecting a patient's decision to refuse treatment
Beneficence	Doing good for others	Administering pain relief to a suffering patient
Nonmaleficence	Avoiding harm to others	Avoiding unnecessary procedures that may cause harm
Justice	Equal and fair treatment	Providing equal care to all patients, regardless of background
Fidelity	Faithfulness to agreements and promises	Respecting patient's confidentiality and privacy
Veracity	Being truthful or telling truth	Informing a patient about his/her diagnosis truthfully
Accountability	Answerable to oneself and others for own action	Owning up to a medication error and reporting it
Responsibility	Liability for specific duties in a particular role	A nurse ensuring proper care of patients in his/her charge

### Code of Ethics for Nurses

- Code of ethics serves as a means of self-regulation and sets the standard of individual behavior for the profession.
- Professional code of ethics is a system of rules and principles and nurses adhere to the professional practice standards by following these.
- An international code of ethics for nurses was first adopted by the **International Council of Nurses in 1953**.
- The **ICN code of ethics** for nurses, most recently, was **revised in the year 2012**.
- Four principal elements of ICN code of ethics:**
  - Nurses and people
  - Nurses and practice
  - Nurses and the profession
  - Nurses and co-workers
- The fundamental responsibility of the nurse is in four areas, namely
  - To promote health
  - To prevent illness
  - To restore health
  - To alleviate suffering

## SOURCES OF LAW



**Figure 1:** Sources of law



### KEY POINTS

- The International Council of Nurses is founded in 1899.
- ICN is an independent, nonpartisan, non-governmental federation of national nurses' associations.



### Clinical Corner

#### CASE SCENARIO 2:

**Two patients with similar medical conditions are admitted to a hospital. Both require immediate medical attention, but there is only one available bed in the ICU. What ethical principle should guide the nurse's decision-making process in this situation?**

- Beneficence
- Fidelity
- Justice
- Autonomy

**Ans. (c) Justice**

(Providing equal and fair treatment to all patients, regardless of background)



### Recent Question (NORCET 2022)

#### 1. Nurses Day theme 2021 was:

- Nurses: a voice to lead - a vision for future healthcare.
- Nurses: A voice to lead - Nursing the World to Health.
- Nurses: A voice to lead - Health for All.
- Nurses: A voice to lead - Health is a Human Right.

Ans: a.

**Ans. (a) Nurses: a voice to lead - a vision for future healthcare.**





## Golden Points to Remember

- Heat loss due to contact with circulating air movement is known as **convection**.
- Transfer of heat from one object to other without contact is known as **radiation** (60% heat loss from skin is through radiation).
- Normal **oral temperature is 98.6°F (37°C)**.
- Normal **axillary temperature is 97.6°F (36.4°C) [1°F lesser than oral temperature]**.
- Normal **rectal temperature is 99.6°F (37°C) [1°F higher than oral temperature]**.
- **Hypothermia**—Temperature <95°F.
- **Hyperthermia**—Temperature up to 105°F.
- **Hyperpyrexia**—Temperature >105°F.
- Rectal temperature is the most reliable to assess core temperature.
- To assess rectal temperature, the thermometer is inserted 1.5 inch in adult and 1 inch in children. Position – Left lateral.
- Wipe the thermometer from **bulb to stem** with **moist swab before taking temperature**.
- Wipe the thermometer from **stem to bulb** with **dry swab after taking temperature**.
- **Relapsing fever:** Fever episodes are separated by intervals of normal temperature for days or weeks.
- **Lysis:** Temperature falls in a zigzag manner (step-ladder pattern).
- **Crisis:** Sudden return of temperature to the normal range from a very high temperature.
- **Rigor:** Sudden rise in body temperature with shivering as seen in malaria.
- **Inverse fever:** Temperature rises in the early morning rather than in the evening.
- Increased depth of breathing with normal respiratory rate is called **hyperpnea**.
- **Cheyne-Stokes Respiration** is characterized by altered period of tachypnea and apnea.
- **Kussmaul respiration** (air hunger) is associated with severe metabolic acidosis and diabetic ketoacidosis.
- Always count pulse for one full minute.
- **Pulse pressure** refers to the difference between systolic blood pressure and diastolic blood pressure.
- Pulse Pressure = Systolic Blood Pressure – Diastolic Blood Pressure
- Width of the cuff should be 40% of the arm circumference and length of the cuff should be 80% of the **arm circumference**.
- A **blood pressure cuff** that is too large will give falsely low reading of BP.
- A **blood pressure cuff** that is too small will give falsely high reading of BP.
- **Nonmaleficence** is an ethical principle that obliges one to not inflict intentional harm (to do no harm).
- **Intentional torts** include assault, battery, false imprisonment, intentional infliction of emotional distress, libel, slander and trespassing.
- **Beneficence:** Doing good for patients and providing benefit balanced against risk.
- **Fidelity:** Being loyal and faithful to commitments and accountable for responsibilities.
- **Veracity:** Telling the truth and not intentionally deceiving or misleading patients.
- **Slander** refers to crime of making false spoken statement damaging to a person's reputation.
- A patient whose life is threatened and who is comatose is assumed to give **implied consent**.
- Movement of an extremity away from the body midline is called **abduction**.
- **Adduction:** Moving toward midline of the body.
- **Extension:** Straightening a joint.
- **Flexion:** Bending motion that decreases the angle of joint.
- **Isotonic solutions** allow free movement of water across the membrane without changing concentration of solutes on either side, e.g., 0.9% NaCl.
- **Hypotonic solution:** Solutions in which solutes are less concentrated than in the cells, e.g., 0.45% NS.
- **Hypertonic solution:** Fluids with solutes more concentrated than in cells, e.g. 5% dextrose.
- Hospital has to keep MLC record up to **Ten Years**, because it serves to demonstrate professional integrity.
- The **order** of techniques during physical examination (except abdominal exam) is **Inspection – Palpation – Percussion – Auscultation**.
- For abdominal exam, the order of examination technique is **Inspection – Auscultation – Percussion – Palpation**. It is because percussion or palpation may alter the bowel sound.
- **Surgical asepsis** or “sterile technique” is used in surgery and invasive procedures.
- Medical asepsis or “clean technique” involves procedures to reduce the number and transmission of pathogens.
- Sterilization aims at killing all microorganisms and their spores. To be effective, the autoclave must reach 121°C and maintain temperature for at least 30 minutes.
- The most unreliable method of sterilization is **sunlight**. Microbicidal activity takes place due to the presence of UV rays. It does not kill spores.
- Gently pulling and inverting **gloves** when removing them decreases the risk of spreading the pathogens.
- Oxygen has a drying effect on mucous membrane that results in damage to the airways, secretions may become thick and difficult to clear, and it also causes airway obstructions. Oxygen has to be humidified before administration.
- Taping the Foley catheter to upper thigh helps to prevent accidental removal, decreases the trauma to urethra/bladder.
- If a patient has taken cold or hot drink, wait for 10–20 minutes in order to measure the right oral temperature.
- If a patient develops chills and headache during blood transfusion, the immediate action is to **stop the transfusion**.
- **Common indication of infiltration** of a peripheral intravenous infusion is cool skin around the insertion site. Other signs

Wanna Listen &amp; Recall these

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Listen &amp; Recall

Golden Points



Contd...

**“He who has health has hope; and he who has hope has everything.”**

—Arabian proverb



# CLINICAL CASE-BASED QUESTIONS

1

Sireen, a trainee nurse, is posted in surgical ward. She is helping the nursing head in inventory management. Where she noticed that high-risk medications are kept separately under locker. The head nurse then asked her that which of the high-risk medication is kept under double lock?

- a. Insulin
- b. Digoxin
- c. Fentanyl
- d. Potassium chloride 10%

**Ans. (c) Fentanyl**

**Explanation:** Among the options provided, fentanyl is considered a high-risk medication and is often stored under double lock. Fentanyl is a potent opioid analgesic and is classified as a controlled substance due to its potential for abuse and the risk of respiratory depression. Storing it under double lock helps ensure its safekeeping and prevents unauthorized access.

---

2

You are an operation theater (OT) nursing officer. Today you are assigned in the laparoscopic OT to function as a scrub nurse. The patient has been taken inside the OT and the entire operative team verified the patient, site of the operation, and procedure before the incision. Which of the following surgical safety checklist point is being performed in the given scenario?

- a. Sign in
- b. Sign out
- c. Time out
- d. All of the above

**Ans. (c) Time Out**

**Explanation:** The surgical safety checklist consists of three main points: Sign in, time out, and sign out. The time out checklist point is performed before the incision to verify the patient's identity, the site of the operation, and the procedure. It is a critical safety check to help prevent wrong-site, wrong-patient, and wrong-procedure surgery.

The sign in checklist point is performed before the patient enters the operating room to verify the patient's identity, allergies, and medical history. The sign out checklist point is performed after the surgery is complete to ensure that all instruments and supplies have been accounted for.

So, in the given scenario, the surgical safety checklist point being performed is the time out.

---

3

A clinical instructor is providing bedside teaching to the 2nd year BSc nursing students about the whoosh test on a patient with NG tube. Select the most appropriate statement related to the test.

- a. It is used to assess the correct placement of NG tube.
- b. The examiner will place the diaphragm of the stethoscope over the left upper quadrant of abdomen to listen to the bubbling air sound.
- c. The air is injected with the help of syringe through the NG tube while simultaneously auscultating, a whoosh sound is heard which indicates the tube is in stomach.
- d. All of the above.

**Ans. (d) All of the above.**

**Explanation:** The whoosh test is a bedside procedure that is used to assess the correct placement of a nasogastric (NG) tube. The test is performed by injecting air through the NG tube while simultaneously auscultating the left upper quadrant of the abdomen. If a whoosh sound is heard, it indicates that the tube is in the stomach.

The steps on how to perform the whoosh test:

1. Attach a syringe to the end of the NG tube.
  2. Aspirate any stomach contents from the tube.
  3. Inject 10–20 mL of air into the tube.
  4. Place the diaphragm of the stethoscope over the left upper quadrant of the abdomen.
  5. Listen for a whoosh sound.
- 

4

When a nurse suspects an air embolism due to the accidental disconnection of parenteral nutrition tubing from the central line catheter, which of the following position should the client be placed in?

- a. On the left side, with head lower than the feet.
- b. On the left side, with the head end elevated.
- c. On the right side, with head lower than the feet.
- d. On the right side, with head end elevated.

**Ans. (a) On the left side, with head lower than the feet.**

**Explanation:** In case of suspected venous air embolism, Durant's maneuver is performed. Durant's maneuver involves placing the patient in the left lateral decubitus position, with the head lower than the feet. This position helps to trap the air bubble in the right atrium of the heart, where it can be more easily absorbed.

---

# ? Image-Based Questions

1. Identify the device shown in the image:



- a. Vacutainer                      b. Tissue culture bottle  
c. Culture swab stick              d. Blood culture bottle

5. The appropriate sterilization method for the device shown in the photograph is:

*(Refer explanation at the end)*



- a. Autoclave                      b. Hot air oven  
c. Ethylene dioxide              d. Gluteraldehyde

2. Which of the following vacutainer tube is used to collect blood sample for coagulation test?

*(Refer explanation at the end)*



- a. Blue                              b. Orange  
c. Green                              d. Pink

6. Principle on which instrument shown in photograph causes sterilization:



- a. Steam under pressure  
b. Dry heat  
c. Convection current in water molecules  
d. Tyndallization

3. The type of restrain shown in the image is known as:

*(Refer explanation at the end)*



- a. Allen restrain                      b. Mitten restrain  
c. Vests wrap                      d. Handcuff bracelet

7. Instrument shown in photograph is used in public health for:



- a. Head circumference  
b. Mid arm circumference  
c. Skin fold thickness  
d. Cold chain temperature monitoring

4. Identify the name of the device used to measure height in adults:



- a. Nomogram                      b. Stadiometer  
c. Vernier gauge                      d. Interferometer

8. Identify the apparatus used in pediatrics as shown in photograph:



- a. Resuscitator                      b. Nebulizer machine  
c. Irradiance meter                      d. Suction machine



**Ans.**

1. c  
2. a  
3. b  
4. b  
5. b  
6. b  
7. c  
8. b

“Sometimes the remedy is worse than the disease.”

—Francis Bacon



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### DEFINITION OF NURSING

- Which of the following phrase best describes ‘the science of nursing’?
  - Application of clinical skills
  - Holistic approach in patient care
  - Body of nursing knowledge
  - Art of specialized nursing care
- “The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recover”. This definition of nursing is stated by:
  - Florence Nightingale
  - Dorothea Orem
  - Virginia Henderson
  - Calista Roy
- “The act of assisting others in the provision and management of self-care to maintain or improve human functioning at home level of effectiveness”. The given statement regarding the Nursing professional is proposed by:
  - Florence Nightingale
  - Dorothea Orem
  - Virginia Henderson
  - Calista Roy
- The definition given by the Florence Nightingale mainly focuses on:
  - Love and affection
  - Evidence based practice
  - Reliable and valid care
  - Utilizing the environment for Recovery.
- “Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings.” Which of the following Institution has given this definition regarding Nursing Professions in the year of 2002?
  - INC
  - WHO
  - TNAI
  - ICN
- Which of the following agency defines the nursing and its values as “Nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response”?
  - World Health Organization
  - Indian Nursing Council
  - American Nurse association
  - International council of Nurses
- Adaptation Model of Nursing with Five major needs for human physiology was developed by the Sister:
  - Callista Roy
  - Betty Neumann
  - Dorothea Orem
  - Henderson
- The Word “Nurse” is rendered from the Latin word “NutriX” which refers the actual meaning of:
  - Care
  - Cure
  - Nourish
  - Nutritious

- The Knowledge-based Nursing practices and core skills for this profession mainly depend on the:

- Reporting and Documentation
- Research and Analysis
- Diagnosis, Intervention and Evaluation
- History collection and Assessment

**Explanation:** By performing the Appropriate diagnosis for a condition and treating the condition with the actual intervention and evaluating the result will enhance the knowledge-based practice and limit the occurrence of error.

- International council for Nurses was first established in the year of:

- 1899
- 1908
- 1923
- 1945

### HISTORY OF NURSING

- The first school of nursing was established by:

- Virginia Henderson
  - Theodor Fliedner
  - Florence Nightingale
  - Isabel Hampton
- (AIIMS Raipur Grade II 2017)

**Explanation:** In 1836, Pastor Theodor Fliedner established the Kaiserswerth School for Nursing in his parish in Kaiserswerth, Germany. It was one of the first formally established schools of nursing in the world. Florence Nightingale established St. Thomas’ Hospital and the Nightingale Training School for Nurses in 1860.

- International day for nurses is celebrated on:

- December 1
- May 12
- June 2
- May 1

**Explanation:** International nurses day is celebrated on May 12, which is the birth day of Florence Nightingale

- Florence Nightingale was born on: (Recent Question 2012)

- May 12th 1820
- May 12th 1832
- April 7th 1820
- June 7th 1842

- In 1860, Nightingale set up the first nursing training school at: (ESIC Chennai May 2012)

- St. Thomas’ Hospital, London
- University of Edinburgh
- Petersburg, Virginia
- None of the above

- ICM theme for International Nurses Day 2023 is ... **New Q**

- Closing the gap: Millennium Development Goals
- Our Nurses. Our Future
- Nurses: A voice to lead – Invest in Nursing and respect rights to secure global health
- Nurses: A voice to lead - Health for All

Ans.

- c
- c
- b
- d
- d
- c
- a
- c
- c
- a
- b
- b
- a
- a
- b



"It is health that is real wealth and not pieces of gold and silver."

—Mahatma Gandhi

## CHAPTER

# 2



# MEDICAL SURGICAL NURSING/ ADULT HEALTH NURSING

## SYNOPSIS

### INFLAMMATION AND WOUND HEALING

#### INFLAMMATION

**Definition:** Inflammation is a localized reaction intended to neutralize, control or eliminate the offending agent to prepare the site for repair.

#### Five Cardinal Signs of Inflammation

1. Redness
2. Warmth (Heat)
3. Swelling
4. Pain
5. Loss of function

#### Chemical Mediators

- a. Histamine released by mast cells at the site of injury causes vasodilation and vascular permeability.
- b. Kinins are responsible to attract neutrophils.
- c. Prostaglandins cause increased vascular permeability.

#### Three Phases of Inflammation

##### Phase 1: Inflammatory response (3–5 days)

- a. Transient vasoconstriction occurs immediately after injury followed by vasodilation and increased capillary permeability which results in redness, swelling and warmth.
- b. Exudate consists of plasma, plasma proteins, solutes, WBCs, etc., migrate into tissues resulting in pressure of fluid on nerve endings (*pain and loss of function*).
- c. Leukocytes are responsible for engulfing offending organisms and for removing cellular debris. (*phagocytosis by macrophages*).

##### Phase 2: Repair and Regeneration (2–8 weeks)

- a. It is characterized by new collagen formation.
- b. These fibers are laid down in disorganized manner to make scar but the link between fibers is weak.

Thus new tissue is susceptible to disruption on aggressive activity.

##### Phase 3: Remodeling and Maturation (Months to years)

- a. In this phase, tissue continues to remodel, strengthen and improve its cellular organization.
- b. Increase in organization of collagen fibers and bonds become stronger.

#### Exudate

The fluid involved in inflammatory edema is known as exudate.

- a. **Serous exudate:** Water-like exudate; seen in minor injury
- b. **Fibrinous exudate:** Contains fibrin
- c. **Purulent exudate (pus):** Creamy white exudate from dead neutrophils; seen in bacterial infection
- d. **Hemorrhagic exudate:** Bloody red exudate

### WOUND HEALING

**Definition:** Wound healing is a complex and dynamic process of replacing devitalized and missing cellular structures and tissue layers.

#### Types of Wounds

- **Acute wound:** Heals without many complications within expected time frame, e.g., surgical wounds and trauma wounds.
- **Chronic wound:** Underlying pathology or infection causes wound or interferes with the healing process. For example, diabetic ulcer and pressure ulcer.

#### POINT TO REMEMBER

Fever is systemic response of inflammation.

#### Recent Questions (NORCET 2020)

1. Which of the following is incorrect about bed sore?

- a. Mobilization will affect bed sore?
- b. Moisture will affect bed sore
- c. Friction force will affect bed sore
- d. Nutritional status does not affect bed sore

Ans. (d) Nutritional status does not affect bed sore...

2. A 65-year-old patient admitted in a long-term care facility has developed pressure ulcer. On assessment, the nurse found that the bone is visible and palpable on the wound site. The nurse knows that the stage of the pressure ulcer is:

- a. Stage-I
- b. Stage-II
- c. Stage-III
- d. Stage-IV

Ans. (d) Stage-IV

## Wound Healing Process

- **Healing by primary intention:** No or little scar tissue. For example, surgical wounds.
- **Healing by secondary intention:** Marked loss of tissue. Edges of the wound are too far and wound gets closed naturally through granulation and epithelialization. For example, lacerated wounds, pressure ulcers, and traumatic injuries.
- **Healing by tertiary intention:** Characterized by delayed wound closure. This results in granulation of wound edges. Characterized by edema, infection, exudates from wound and excessive scar formation.

## Stages of Wound Healing

The following are four stages of wound healing:

1. **Hemostasis:** Causes coagulation
  2. **Inflammation:** Destroys bacteria and removes debris
  3. **Proliferation:** Fills and covers the wound
  4. **Maturation:** Tissue gains strength and flexibility
- Wound healing can progress backward or forward depending on internal and external patient conditions.

### Hemostasis

(A brief period of vasoconstriction as an attempt to stop the bleeding).

- Begins at the onset of injury and its objective is to stop bleeding.
- Blood vessels constrict to restrict the blood flow.
- Platelets stick together and adhere to sub-endothelium surface of epithelial wall of blood vessel in order to seal the break.
- After this, first fibrin strand begins to adhere in about 60 seconds.
- As the fibrin mesh begins, blood is transformed from liquid to gel through coagulation.

### Inflammatory Phase

(Starts immediately after injury and lasts for 2–6 hours)

- Injured blood vessels leak exudate (neutrophils, water, salt and proteins) and cause localized swelling.
- Increased capillary permeability and blood flow to the site of injury assists phagocytosis.
- During this phase, damaged cells, pathogens and bacteria are removed from wound area.
- Swelling, redness and pain in the injured/affected area are common in this phase.

### Proliferation

This stage has three distinct phases:

1. Filling the wound
2. Contraction of wound margins
3. Covering the wound (Epithelialization)
  - It is a phase of rebuilding of new tissues made up of collagen and extracellular matrix.
  - Formation of granulation tissue (pink-to-red moist tissue) followed by epithelialization (migration of epithelial cells across wound surface).
  - New network of blood vessels is constructed for sufficient supply of oxygen and nutrients to granulation tissue.

### Maturation Phase

(Remodeling stage)

- Strengthening and reorganization of collagen occurs (remodeling of Collagen).
- Cells that had been used to repair the wound but no longer needed are removed by apoptosis.
- Scar thickness reduces and makes the area stronger.
- The process takes months to year. It takes 2–3 weeks to regain 50% of strength.
- Only 70–75% of its original strength will be regained at the end of wound healing process.

## Recent Question (CNCI 2021)

3. While assessing Mr. Gupta with Braden Scale, the score attained was 8 which indicates that the risk of developing pressure sore for Mr. Gupta is \_\_\_\_\_
- a. Mild
  - b. Moderate
  - c. High
  - d. Very High

Ans. (d) Very High

## KEY POINTS

- Blood vessels constrict to restrict the blood flow during **hemostasis stage** of wound healing.
- The **inflammatory/exudative phase of wound healing** is from onset of wound (day 1 to day 4).
- Contraction of wound margins and covering (epithelialization) occurs during **proliferation stage** of wound healing.
- **Surgical wound** is an example of healing with primary intention.
- Lacerated wounds, pressure ulcers and traumatic injuries are the examples of healing with secondary intention.



## KEY POINTS

- Cellulitis: Inflammation of subcutaneous connective tissue (inner layer of the skin)
- Colonization: Presence of proliferating bacteria without causing systemic or local infections (without a host response to presence of bacteria)
- Dehiscence: Wound ruptures along (splitting) a surgical line
- Full thickness wound: Wound indicates that damage extends below all layers of the skin into the subcutaneous tissue or beyond (i.e., muscle, tendons, bone or other adjacent structures)
- Maceration: Softening and breaking down of skin surrounding the wound due to prolonged contact with moisture.
- Partial thickness wound: Loss of epidermis with involvement of all or part of dermis layer of the skin.
- Sloughing: Process of shedding necrotic (dead) tissues from the wound or skin.



“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INFLAMMATION AND WOUND HEALING

#### INFLAMMATION

1. Severe generalized edema is called: (Safdarjung NO 2018)
- Myxedema
  - Pitting edema
  - Anasarca
  - Dependent edema

#### Explanation:

- When Edema is massive and generalized, it is called anasarca. It is caused by a variety of clinical conditions, like heart failure, renal failure, liver failure, or problems with the lymphatic system.
- The swelling is mainly caused by abnormal retention of body fluids in extracellular space and body tissues. Due to this, Anasarca is also known as dropsy, massive edema or generalized edema. In Anasarca the inflammation is widespread throughout the whole body.

2. Which of the following is NOT a plasma-derived chemical mediators?

- Cytokines
- Complement components
- Kinins
- Coagulation proteins

3. Cytokines are secreted by:

- Neutrophils
- B-Lymphocytes
- Endothelial cells
- All of the above

4. Which of the following increases vascular permeability during acute inflammation?

- Histamine
- Cytokines
- AFP
- Both A and B

5. Mechanism behind the characteristic feature of acute inflammation is:

- Redness and pain
- Pancytopenia
- Vasodilatation and increased vascular permeability
- Spongy bone marrow

6. The classical substances that increase the sensitivity of pain receptors by enhancing the pain-provoking effect of bradykinin is (ESIC 2019)

- Nociceptor
- Endorphins
- Prostaglandins
- Enkephalin

#### Explanation:

- High levels of prostaglandins are produced in response to injury or infection and cause inflammation, which is associated with the symptoms of redness, swelling, pain and fever. This is an important part of the body's normal healing process.
- In contrast**, Endorphins – causes analgesic effect.

7. Which of the following is a substance that decreases pain transmission and causes an inflammatory response? (AIIMS-BBS SNO 2019)

- Substance P
- Endorphin
- Prostaglandin
- Histamine

8. All of the following are evidences of an infection, Except

- Elevated WBC
- Purulent drainage
- Primary intention
- Increased leukocytes

9. Hemorrhage with collection of blood in the soft tissue is called

- Contusion
- Purpura
- Ecchymoses
- Hematoma

10. Thick yellow drainage from the wound is known as: (AIIMS 2016)

- Sanguineous
- Serous-sanguineous
- Serous
- Purulent

**Explanation:** Clear and watery drainage is serous. Sanguineous drainage is fresh blood that is prevalent among deep wounds of full and partial thickness. Serous-sanguineous leakage is thin and watery, and it's pink in color. Purulent drainage is when the leakage from wound appears milky. It's generally gray, green or yellow.

11. Which of the following types of exudates contains fibrin?

- Hemorrhagic exudate
- Serous exudate
- Fibrinous exudate
- Purulent exudate

#### WOUND HEALING

12. An opening of surgical wound edges is called: (AIIMS Nagpur NO 2018)

- Wound evisceration
- Wound rupture
- Wound approximation
- Wound dehiscence

#### Explanation:

- Wound dehiscence** is a surgical complication in which a wound ruptures along a surgical incision. It may be due to too tight suturing or loose improper suturing, sneezing, and coughing.
- Wound evisceration - surgical incision opens (dehiscence) and the abdominal organs protrude or come out of the incision.

13. Diffuse, purulent inflammation of a tissue is called \_\_\_\_\_. (AIIMS Nagpur NO 2018)

- Abscess
- Cellulitis
- Boils
- Ulcers

#### Explanation:

- Cellulitis** is a bacterial infection of underlying layers of the skin and the site of infection turns red with swelling and pain. It can be purulent (presence of pus) or non-purulent.
- Key point:** Cellulitis is diffused whereas abscess is localized.

#### Ans.

- c
- a
- d
- d
- c
- c
- b
- c
- d
- d
- c
- d
- b



**14. First process in wound healing:**

- a. Collagen fibril will form
- b. Granulation tissue will appear
- c. First intentional healing will take place
- d. Neutrophils line the wound edge

**15. The inflammatory/exudative phase of wound healing will last for:** (ESIC 2019)

- a. 1 year
- b. 1-4 days
- c. 21 days to a month
- d. 5-20 days.

**Explanation:** The inflammatory/exudative phase of wound healing is from onset of wound (day 1) to Day 4. **Healing actions in this stage include** Clot formation to arrest bleeding, migration of inflammatory cells to the site of wound, neutralization of bacteria by macrophages and WBC and secretion of growth factors and cytokines.

**16. If the incisional area of an abdominal surgery is weak, what is possible to happen when abdominal muscles contract and increases intra abdominal pressure?**

- a. Evisceration
- b. Dehiscence
- c. Laceration
- d. Shearing

**17. Stab wound for a drainage system is known as**

- a. Incision
- b. Puncture
- c. Cautery
- d. Laceration

**18. In which of the following, the phases of wound healing is arranged in sequence?**

- a. Inflammatory phase, hemostasis, reconstruction, maturation
- b. Hemostasis, reconstruction, maturation, inflammatory phase
- c. Hemostasis, inflammatory phase, reconstruction, maturation
- d. Hemostasis, maturation, inflammatory phase, reconstruction

**19. Which of the following is in the blood clot helps hold the wound together during hemostasis phase of wound healing?**

- a. Granulation
- b. Neutrophil
- c. Fibrin
- d. Leucocytes

**20. Wound dehiscence primarily takes place during which phase of wound healing?**

- a. Maturation phase
- b. Homeostasis
- c. Inflammatory phase
- d. Reconstruction phase

**21. Overgrowth of a collagenous scar tissue at the site of the wound is known as:**

- a. Granulation
- b. Keloid
- c. Hematoma
- d. Celluloid

**22. The term applied for the fluid, cells, or other substances that are slowly discharged, from cells or blood through small pores or breaks in cell membranes is:**

- a. Exudate
- b. Pus
- c. Infiltrates
- d. Secretion

**23. Soft, pink, fleshy projections consisting of capillaries surrounded by fibrous collagen:**

- a. Keloid
- b. Granulation tissue
- c. Cellulitis
- d. Collagen

**24. Which of the following factors is most likely to inhibit wound healing by interfering with the mechanisms that release oxygen to tissues and reducing the amount of functional hemoglobin in blood?**

- a. Obesity
- b. Smoking
- c. Radiation
- d. None of the above

**25. All of the following factors lead to impaired wound healing process; EXCEPT:**

- a. Impaired oxygenation, obesity and smoking
- b. Drugs, diabetes mellitus and wound stress
- c. Height, weight and body mass
- d. Radiation, malnutrition and age

**26. Complications of wound healing is:**

- a. Infection and supuration
- b. Hypertrophied scar or keloid formation
- c. Contracture
- d. All of the above

**27. The dressings over closed wound usually are removed on the**

- a. Day after surgery
- b. Next of surgery
- c. On the third day
- d. When the Doctor gives the order

**28. How often would you inspect the dressings during the first day after surgery?**

- a. Every hour for the first 24 hours
- b. Two to four hours for the first 24 hours
- c. Two to four hours for first 12 hours
- d. Every 6 to 8 hours for the first 24 hours

**29. Correct about healing by primary intention is:**

- a. It is seen in healthy wound
- b. Epithelial layer damage is there
- c. Minimal granulation tissue formation
- d. All of the above

**30. Correct about healing by secondary intention is:**

- a. Seen in extensive tissue damage
- b. Wound contraction will be there
- c. Abundant granulation tissue and scarring can be seen
- d. All of the above

**31. Healing of a laceration can be promoted by:**

- a. Antibiotics
- b. Daily dressing
- c. Pressure dressing and ROM
- d. Pressure dressing and dry cold application

**32. Edema develops if plasma albumin falls below:** New Q

- a. 2.5 g/dL
- b. 3.5 g/dL
- c. 4.5 g/dL
- d. 5.0 g/dL

**Explanation:** The normal plasma level of albumin in an adult is 3.5 to 5.5 grams per deciliter (g/dL). It is responsible for most of the osmotic pressure of blood. The osmotic pressure of blood helps to keep water from leaving the blood vessels and leaking into the tissues. If the albumin level falls below 2.5 g/dL, the osmotic pressure of blood will decrease, and water will leak into the tissues, causing edema.

**33. What is the most appropriate nursing intervention while treating a laceration?** (ISRO)

- a. Monitor blood pressure
- b. Elevate the body part
- c. Apply pressure dressing and heat
- d. Apply pressure dressing and ice pack

Ref: <https://www.drugs.com/cg/laceration-aftercare-instructions.html>

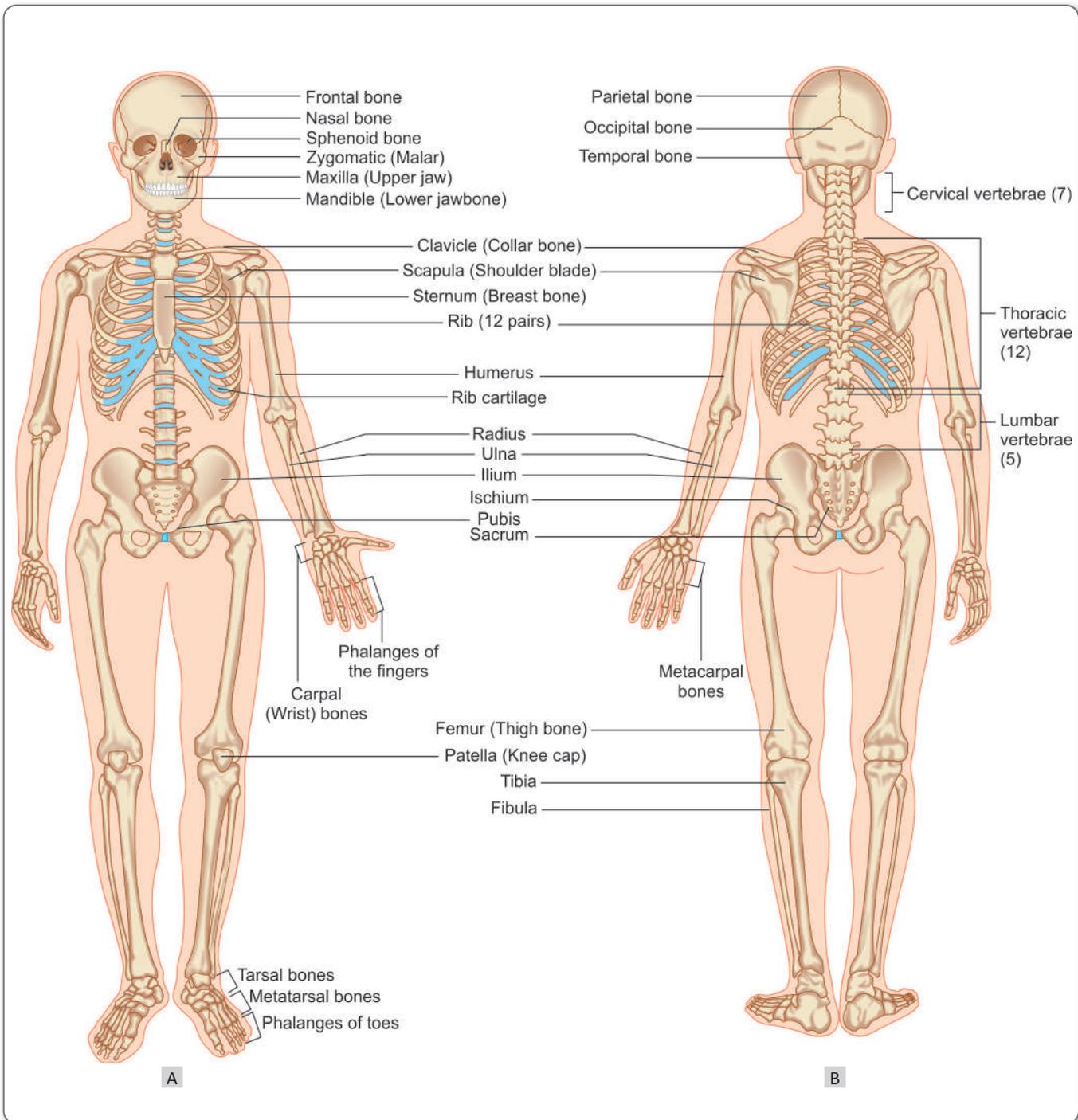
**Explanation:** For the management of Laceration, Apply direct pressure over the wound to stop bleeding and apply ice on the wound every 15 to 20 min. Ice helps prevent tissue damage and decreases swelling and pain.

**Ans.**

- 14. d
- 15. b
- 16. b
- 17. b
- 18. c
- 19. c
- 20. d
- 21. b
- 22. a
- 23. b
- 24. b
- 25. c
- 26. d
- 27. c
- 28. b
- 29. d
- 30. d
- 31. d
- 32. a
- 33. d

## MUSCULOSKELETAL SYSTEM

### ANATOMY AND PHYSIOLOGY OF MUSCULOSKELETAL SYSTEM



**Figures 3A and B:** Skeletal system of human body: (A) Anterior view; (B) Posterior view



## CLASSIFICATION OF BONES

**Table 10:** Classification of bones with their numbers in human body

S.No.	Name	Number	Bone
<b>Axial skeleton (80 bones)</b>			
1	• Cranial bones	8	Frontal bone-1 Parietal bones-2 Temporal bones-2 Occipital bone-1 Ethmoid bone-1 Sphenoid bone-1
	• Facial bones	14	Zygomatic bones-2 Maxilla bones-2 Nasal bones-2 Lacrimal bones-2 Vomer bone-1 Palatine bones-2 Inferior nasal conchae-2 Mandible-1
2	Hyoid bone	01	Hyoid bone-1
3	Auditory ossicles	06	Malleus-2 Incus-2 Stapes-2
4	Rib cage	25	Ribs-24 Sternum-01
5	Vertebral column	26	Cervical vertebrae-7 Thoracic vertebrae-12 Lumbar vertebrae-5 Sacrum vertebra-1 Coccyx vertebra-1
<b>Total</b>			<b>80 bones</b>
<b>Appendicular skeleton (126 bones)</b>			
1	Shoulder girdle	4	Scapulae-2, Clavicle-2
2	Upper extremity	60	Humerus-2 (1 + 1) Radius-2 (1 + 1) Ulna-2 (1 + 1) Carpals-16 (8 + 8) Metacarpals-10 (5 + 5) Phalanges-28 (14 + 14)
3	Pelvic girdle	02	Innominate bones-2
4	Lower extremity	60	Femur-2 (1 + 1) Tibia-2 (1 + 1) Fibula 2 (1 + 1) Patella-2 (1 + 1) Tarsals-14 (7 + 7) Metatarsals-10 (5 + 5) Phalanges-28 (14 + 14)
<b>Total bones</b>			<b>80 (Axial) + 126 (Appendicular) = 206</b>

- There are 206 bones in human body.
- Among 206 bones, 80 bones are the part of axial skeleton which comprise skull, vertebral column and thorax.
- 126 bones are the part of appendicular skeleton system.
- Based upon the shape, bones in the human body are classified into four categories which is shown in Table 11.



“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### MUSCULOSKELETAL SYSTEM

#### CLASSIFICATION OF BONES

121. In an adult, the skeleton comprises around:  
(ESIC Chennai May 2012)

- a. 40–50% of the total body weight
- b. 30–40% of the total body weight
- c. 60–70% of the total body weight
- d. 10–20% of the total body weight

122. Total number of bones in human body:  
(ESIC Chennai May 2012; RRB Feb 2012; LNJP H D 2012)

- a. 206
- b. 213
- c. 209
- d. 300

123. Total number of facial bones: (RRB Feb 2012)

- a. 12
- b. 10
- c. 14
- d. 16

124. Number of bones in the skull is:

- a. 22
- b. 24
- c. 26
- d. 28

125. Which of the following vertebral bone consists of 5 fused bones?

- a. Atlas
- b. Axis
- c. Coccyx
- d. Sacrum

126. There are \_\_\_\_\_ pairs of ribs present in human body:

- a. 10 pairs
- b. 11 pairs
- c. 12 pairs
- d. 13 pairs

127. How many pairs of true ribs are there?

- a. 7
- b. 8
- c. 10
- d. 12

128. Number of floating ribs is:

- a. 2 pairs
- b. 3 pairs
- c. 4 pairs
- d. 5 pairs

129. False rib is:

- a. 1st rib
- b. 2nd rib
- c. 7th rib
- d. 10th rib

130. True ribs are (pair or number):

- a. 7th rib
- b. 8th rib
- c. 10th rib
- d. 12th rib

131. Total number of metatarsal bones in human body is:

- a. 8
- b. 10
- c. 14
- d. 16

132. Total number of carpal bones in human body is:

- a. 8
- b. 10
- c. 14
- d. 16

133. Total number of intercostal muscles is:

- a. 9 pairs
- b. 10 pairs
- c. 11 pairs
- d. 12 pairs

#### ANATOMY OF BONE

134. Winging of scapula is caused due to injury to which of the following parts? (AIIMS BBS NO 2018)

- a. Ulnar nerve
- b. Thoracodorsal nerve
- c. Long thoracic nerve of bell
- d. Dorsal scapular nerve

**Explanation:** Injury to the long thoracic nerve causes serratus anterior. Paralysis is the most common cause for Winging of Scapula. Winging of scapula (or scapula alata) is a musculoskeletal disorder characterized by the protrusion of shoulder blade, or shoulder bone, from a person's back in an abnormal position.

135. Muscle of thigh present in anterior aspect:

(Safdarjung NO 2018)

- a. Rectus femoris
- b. Hamstring
- c. Deltoid
- d. Tibialis anterior

**Explanation:** The muscles present in the anterior aspect of the thigh are Sartorius, Quadriceps femoris, Rectus femoris and Articularis genu.

**Hamstring muscles** are present at the back of thigh and knee. **Deltoid muscle** is the muscle of the scapular region and upper limb. **Tibialis anterior** is the muscle of the anterior compartment of the leg.

136. Identify the hip bone from the following:

(DSSSB PHN, 2015)

- a. Femur
- b. Humerus
- c. Innominate
- d. Sacrum

137. The muscle covers the shoulder and the back of the neck is:

(Kerala PSC, Nov 2014)

- a. Trapezius
- b. Masseter
- c. Biceps
- d. Temporalis

138. Which bone is the largest bone in human body?

(ESIC Chennai May 2012)

- a. Tibia
- b. Radius
- c. Femur
- d. Humerus

139. Contraction of the abdominal muscles is important in:

- a. Normal (quiet) expiration (ESIC Chennai May 2012)
- b. Forced (maximum) expiration
- c. Normal (quiet) inspiration
- d. Forced (maximum) inspiration

140. Which answer best explains the location of the humerus?

- a. Knee to ankle
- b. Elbow to wrist (on the pinky side)
- c. Elbow to wrist (on the thumb side)
- d. Shoulder to elbow

#### Ans.

- 121. d
- 122. a
- 123. c
- 124. a
- 125. d
- 126. c
- 127. a
- 128. a
- 129. d
- 130. a
- 131. b
- 132. d
- 133. c
- 134. c
- 135. a
- 136. c
- 137. a
- 138. c
- 139. b
- 140. d

141. The elbow is \_\_\_\_\_ to the wrist: (PGIMER 2000)
- Distal
  - Anterior
  - Posterior
  - Proximal

**Explanation:** The elbow before the wrist, means it is proximal to the wrist.

142. The basic structural and functional unit of the skeletal muscle is the:

- Fasciculus
- Fiber
- Myofibril
- Sarcomere

143. The trapezius muscle is located in the:

- Lower leg
- Back
- Forearm
- Buttocks

144. Osteoclasts are known as:

- Bone forming cells
- Bone destroying cells
- Bone repairing cells
- All of the above

145. Which of the following is known as bone forming cells?

- Fibrinoblasts
- Osteocytes
- Osteoclasts
- Osteoblasts

146. Site of growth in length of a long bone is:

- Diaphysis
- Epiphyseal plate
- Bone marrow
- Periosteum

147. Covering of the bone is:

- Diaphysis
- Epiphyseal plate
- Bone marrow
- Periosteum

148. True regarding isometric contraction is:

- Shortening of muscle fiber
- Lengthening of muscle fiber
- Length of muscle fiber remains the same
- Pressure of the muscle remain unchanged

149. True regarding concentric isotonic contraction is:

- Shortening of muscle fiber
- Lengthening of muscle fiber
- Length of muscle fiber remains the same
- Pressure of the muscle remain unchanged

150. Thin filament is:

- Actin
- Troponin
- Tropomyosin
- All of the above

151. The maintenance of posture in a normal adult human being depends upon:

- Integrity of reflex arc
- Muscle power
- Type of muscle fibers
- Joint movements in physiological range

152. Major constituent of bone is:

- Calcium sulphate
- Calcium phosphate
- Magnesium sulphate
- Sodium chloride

153. Vitamin essential for a healthy skeletal system is:

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K

154. Osteocytes are located in:

- Lamellae
- Haversian canals
- Canaliculi
- Lacunae

155. True regarding intramembranous ossification is:

- In the bones of the roof of the skull
- As a process that produces most of the skeletal system
- When ones develop from cartilage models
- When osteoblasts invade the spaces left by dying cartilage cells

156. Bones in the axial skeleton include:

- Skull
- Ribs
- Sternum
- All of the above

157. Smallest bone is:

- Malleus
- Incus
- Stapes
- Phalanges

158. Relationships between biceps brachii and triceps brachii muscles are:

- Synergists
- Antagonists
- Both flex the forearm
- Both extend the forearm

159. Main abductor muscle of the upper limb is:

- Latissimus dorsi
- Deltoid
- Pectoralis major
- Pectoralis minor

160. Haversian canal together with the lamellae and surrounding is known as:

- Haversian system
- Canaliculi
- Cancellous bone
- Medullary cavity

161. Ossification starts with .....bone:

- Fontanel
- Clavicle
- Humerus
- Femur

162. Ossification of Posterior fontanels completes at:

- 1½ months
- 3 months
- 6 months
- 18 months

163. Ossification of anterior fontanels completes at:

- 3 months
- 6 months
- 12 months
- 18 months

164. Anterior fontanel is formed by all; EXCEPT:

- Coronal suture
- Frontal bone
- Lambdoid suture
- Sagittal suture

165. The one and only mobile or movable bone in the skull is:

- Maxilla
- Mandible
- Ear ossicle
- Frontal

166. Sinuses means:

- Cavities in the bones
- Nasal cavity
- Nasal blockage
- Space between tissues



**Ans.**

141. d
142. d
143. b
144. b
145. d
146. b
147. d
148. c
149. a
150. d
151. a
152. b
153. b
154. d
155. a
156. d
157. c
158. b
159. b
160. a
161. b
162. a
163. d
164. c
165. b
166. a

## OPHTHALMOLOGY

### ANATOMY AND PHYSIOLOGY OF EYE

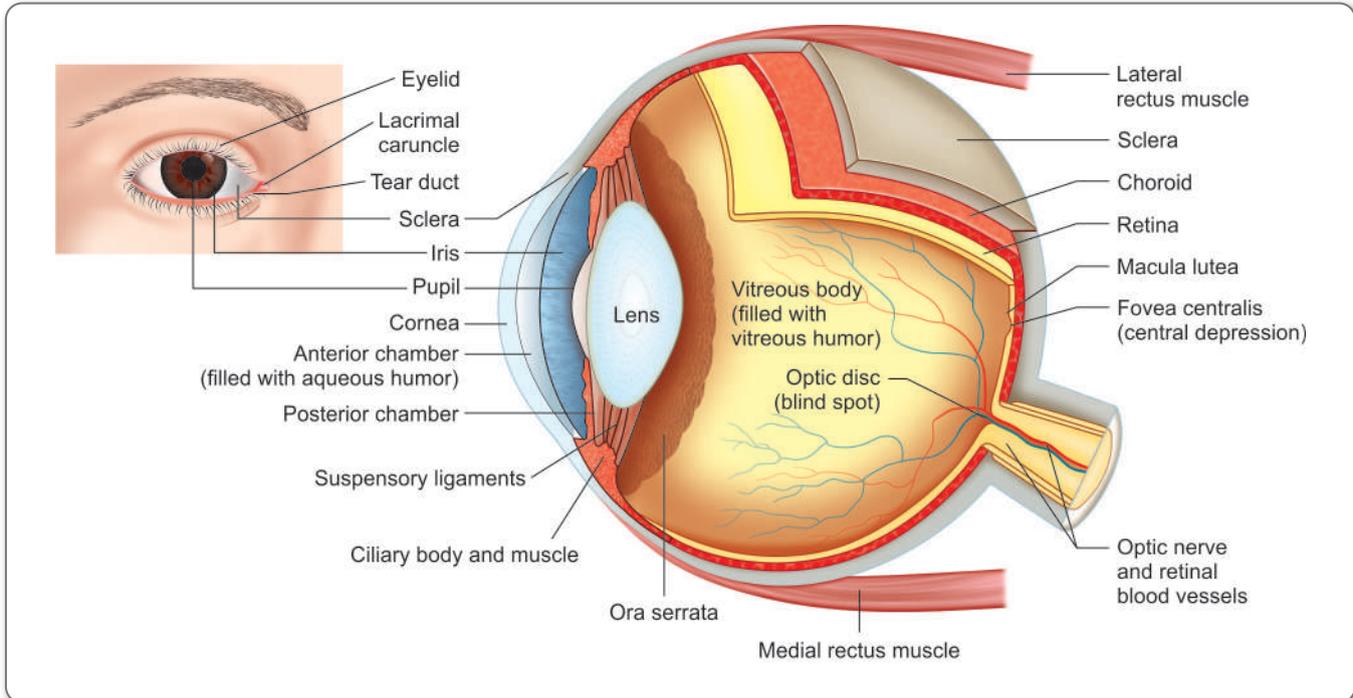


Figure 41: Anatomy of eye

#### Extraocular Structures

##### a. Eye orbit

- It is the bony socket (4 cm in diameter) of skull and protects the eye by pads of fat.

##### b. Eye lids

- These are composed of thin elastic skin and are responsible to protect anterior portion of eye. Eyelids are covered by palpebral conjunctiva.
- Lid margins contain meibomian glands (responsible to provide lipoid component to tears) and eye lashes.
- Upper eyelid movement** is controlled by a muscle called levator palpebrae superioris which is innervated by **cranial nerve-III** (Oculomotor nerve).

##### c. Conjunctiva

- Composed of non-keratinized, stratified squamous epithelium.

It is a thin transparent mucous membrane that nourishes the eye. It is of two types:

- Bulbar conjunctiva:** It covers sclera.

- Palpebral conjunctiva:** It covers the inner surface of eyelids.

##### d. Lacrimal glands

- It is an almond shaped exocrine gland.
- Situated in upper and lateral region of each orbit in frontal bone's fossa.
- Responsible to produce tears (Tear has 3 components—mucoid, Lipoid and aqueous).
- Tears produced by lacrimal glands wash sclera, cornea and flows through lacrimal canal → Lacrimal sac → Nasolacrimal duct.
- Contains lysosomes and Ig A
- Inflammation of the lacrimal glands is called **dacryoadenitis**.
- It is stimulated by parasympathetic nerve of CN VII
- 5–12 small ducts are open.

##### e. Extra ocular muscles

- There are 6 extra ocular muscles and these muscles are innervated by three cranial nerves.
- These muscles are responsible to move eyeball.

#### Recent Question (NORCET 2020)

27. After death of a person, how long cornea can be preserved for transplantation?
- 2 hours
  - 6 hours
  - 8 hours
  - 12 hours

Ans. (b) 6 hours

#### Recent Question (CNCI 2021)

28. The term Aphakia means?
- Inflammation of lens
  - Absence of lens
  - Enhancement of lens
  - Lens disease

Ans. (b) Absence of lens



## POINTS TO REMEMBER

- **Blepharitis** – inflammation of eyelids
- **Chalazion** – cyst on eyelids due to blockage of tarsal glands
- **Stye**- also called hordeolum, acute painful modular infection of sebaceous or meibomian glands

**Table 32:** Nerve supply to eye muscles

Cranial nerve-III (Oculomotor nerve)	<ul style="list-style-type: none"> <li>• Innervates all the extrinsic muscles <b>except</b> superior oblique and lateral rectus</li> </ul>
Cranial nerve-IV (Trochlear nerve)	<ul style="list-style-type: none"> <li>• Superior oblique muscle</li> </ul>
Cranial nerve-VI (Abducent nerve)	<ul style="list-style-type: none"> <li>• Lateral rectus muscle</li> </ul>

## Ocular Structures

## a. Eye ball

- It is 1 inch (2.5 cm) in diameter and is located in orbit.
- It consists of three layers:
  1. External layer (sclera and cornea)
  2. Middle layer (Uveal tract)
  3. Inner layer (Retina)

## b. Layers of Eye

- **External layer (Sclera and Cornea)**
  - **Sclera** is the white part of eye comprising posterior 5/6 of external layer of eye.
  - **Cornea** is the anterior 1/6 part of external layer of eye. It is transparent, avascular and dome like structure. It contains three layers – outer is stratified squamous epithelium, middle lined collagen fiber and inner is simple squamous epithelium.
- **Middle layer (Uveal tract)**
  - Uveal tract consists of choroid, ciliary body and iris.
- **Choroid**
  - Choroid is the vascular layer (1mm thick) and lies between retina and sclera.
  - Choroid provides nourishment to outer layer of retina
- **Ciliary body**
  - Ciliary body consists of ciliary muscles and ciliary process and it connects the choroid and iris.
  - It has two functions: **Production of aqueous humor and Accommodation reflex.**
- **Accommodation** is a process of adjustment of lens thickness as per the distance of the object from eye.
- **For focusing on closer objects:** Ciliary muscles contract → lens convexity increases (controlled by **parasympathetic nervous system**).
- **For focus on distant objects:** Ciliary muscles relax → flattens the lens (controlled by **sympathetic nervous system**).
- **Iris**
  - It is colored, highly vascularized part of eye behind cornea. Color of iris depends on amount of melanin pigment present
  - Pupil is a space through which light enters into eye. It dilates and constricts in response to light (**Pupillary reflex**).
  - Bright light → stimulates sphincter muscles of iris → pupils constrict (controlled by **parasympathetic nervous system**).
  - Dim light → stimulates dilator muscles of iris → pupils dilate (controlled by **sympathetic nervous system**).
- **Inner layer (Retina)**
  - It is the innermost layer of eye and contains photoreceptors – **Cones and Rods**
  - **Cone cells:** Responsible for central, night and color vision, functions in bright light
  - **Rod cells:** Responsible for peripheral vision, functions in dim light.
  - Rod cells contain only single type of rhodopsin photopigment.
  - Cone cells contain three types-
    - Porphyropsin (response to red light)
    - Cyanopsin (response to blue light)
    - Iodopsin (response to green light)
  - It is the layer which converts light into nerve impulses.
  - Optic pathway starts from retina and ends with occipital lobe of cerebrum.
  - **Optic disk:** This is where the optic nerve enters the eyeball. It is also known as **blind spot** because it does not contain any photoreceptors.



## KEY POINTS

- Three **cranial nerves** that are related to eye movements are Oculomotor, Trochlear and Abducens.
- **Pupil** contracts in response to bright light and dilates in dim light.
- **Anisocoria** is unequal pupil size.
- Color blindness is due to problem with cones, genetic X linked.
- Night blindness is due to deficiency of vit. A, which is essential for rod cells.
- Most common type is red-green color blindness.

Recent Question  
(CNCI 2021)

**29. Munson's sign is a characteristic of advanced cases of:**

- Keratoconus
- Cataract
- Strabismus
- Diabetic Retinopathy

**Ans. (a) Keratoconus**

**Explanation:** Keratoconus is an eye disease that affects the structure of the cornea, resulting in loss of vision.





## Golden Points to Remember

650+ Golden Points in Podcast Form  
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Wanna Listen & Recall these

Listen & Recall  
**Golden Points**



- As per WHO data (2015) Coronary artery disease causes most deaths world-wide (8.8 Million deaths) followed by Stroke (6.2 Million deaths).
- High Homocysteine level (>12–15 mmol/L) damages the inner lining of the blood vessel and causes atherosclerosis.
- Orthostatic hypotension is defined as a decrease in **systolic blood pressure** of 20 mm Hg or a decrease in **diastolic blood pressure** of 10 mm Hg within three minutes of standing when compared with blood pressure from the sitting or supine position.
- Outpouching or dilation of arterial wall is called **aneurysm**.
- Pulmonary hypertension increases the workload of the right ventricle and causes right ventricular hypertrophy also known as **cor pulmonale**.
- **Dyspnea** on exertion and **fatigue** are classic symptom of **pulmonary hypertension**.
- World Health Organization recommends a reduction to <2 g/day sodium (5 g/day salt) in adults to reduce the risk of hypertension and cardiovascular disease.
- Postural hypotension (orthostatic hypotension) refers to fall in SBP over 20 mm Hg or DBP over 10 mm Hg when standing up or lying down after sitting (i.e., when there is a change in posture).
- The artificial cardiac pacemaker is an electronic device used to pace the heart when the normal conduction pathway is damaged or diseased.
- Common cause of infective endocarditis are **Staphylococcus aureus** and **Streptococcus viridians, and bacterial**.
- **Dukes Criteria** is used for diagnosis of pericarditis.
- **Roth's spots** are hemorrhagic retinal lesion revealed by fundoscopic examination in infective endocarditis.
- Inadequately treated streptococcal throat might cause **Rheumatic fever**.
- The most common causative agent of rheumatic fever is **streptococcus pyogens**.
- According to **Jones (1944) criteria** the presence of **two major criteria** or **one major and two minor criteria** plus evidence of group A streptococcal infection indicates a high probability of acute rheumatic fever.
- Classic symptom of peripheral arterial disease is intermittent claudication pain that occurs after considerable level of exercise and relieved by rest.
- Clinical manifestation of acute arterial ischemia includes the **six Ps: Pain, Pulselessness, Paresthesia, Paralysis, Pallor** and **Poikilothermia**.
- **Boot-shaped heart** is seen in Fallot's teratology disease.
- **Pear-shaped/flask-shaped** heart is seen in pericardial effusion.
- Right ventricle is the most common site of injury from blunt chest trauma. It is because of the proximity of right ventricle to sternum.
- Dressler syndrome is also known as **late pericarditis**.
- **Pain nature** in pericarditis is progressive, sharp pleuritic in nature, radiates to neck arm and can be relieved by sitting.
- **Hallmark sign of MI** includes severe pain which is not relieved by rest, position change, or nitrate administration.
- **Cardiogenic shock** occurs when inadequate oxygen and nutrients are supplied to the tissue because of left ventricular failure.
- **Cyanosis** and **pallor** are signs of poor perfusion.
- **Assessing the weight of the patient** is the accurate indicator of health status in **heart failure patient who is on diuretics**.
- Major evidence of ischemia is drop in systolic BP of **>20 mm Hg** from baseline BP despite an increase in workload.
- Chest pain can be reduced by administering nitroglycerin, morphin sulfate, and supplemental oxygen.
- **Digitalis** is a positive inotropic agent that improves left ventricular function (increase the force of contraction of left ventricle).
- **Inotropic agents** are the drugs that increase the force of contraction and exert a positive effect.
- **Hypokalemia**, secondary to diuretics, is one of the most common causes of digitalis toxicity.
- **Digitalis toxicity** results in **hyperkalemia**.
- **Digoxin** is contraindicated if apical pulse is below 60 beats per minute because it further decreases heart rate.
- Early symptoms of **digitalis toxicity** include anorexia, nausea, vomiting and visual disturbance.
- Method: HR = number of R waves in a 6 second strip x 10
- Most lethal arrhythmia – Ventricular Fibrillation
- Stimulation of **Vagus Nerve** → Decrease in **Heart Rate**
- **Sinus bradycardia** is seen in athletes.
- Most common site of Myocardial Infarction (MI) is Anterior wall of left ventricle.
- The coronary artery most commonly involved in atherosclerosis is Left Anterior Descending Artery (LAD).
- 'Transportation of triglycerides from liver to adipose tissues' is the function of Very Low Density Lipoproteins (VLDL).
- Person with serum cholesterol level **>200 mg/dL** is at high risk for development of CAD.
- **Osler's nodes** (small, painful nodes in fingers and toes) are seen in **infective endocarditis**.
- The most common direct cause of sudden death is Coronary Artery Disease.
- **Aspirin** in Coronary Artery Disease is used primarily to **inhibit platelet adhesion**.
- **Hemorrhage** and **falling Blood Pressure** are potential complications in the initial 12 hours after cardiac catheterization procedure.
- Most common cause of Intermittent claudication is **atherosclerosis**.
- Most common cardiac anomaly among infants of diabetic mothers is **Transposition of great arteries**.
- **Transfusion** of one unit of Whole Blood/PRBC can increase **Hb by 1 g/dL** and **Hematocrit by 3%** in an adult.
- **Flushed cheeks** are seen in patients with **Mitral stenosis**.
- **Rheumatic fever** is associated with **Valvular heart disease**.
- **Aschoff's bodies** are found in myocardium in rheumatic heart disease.
- Elevated levels of antistreptolysin O are seen in **rheumatic fever**.
- Most common site of **Atherosclerotic plaques** is **Lower Abdominal Aorta**.



Contd...

## ENDOCRINE SYSTEM

### ANATOMY AND PHYSIOLOGY OF ENDOCRINE SYSTEM

- Endocrine glands are ductless glands.
- Their secretions are known as hormones and these are secreted directly into the blood.

- Hormones are of different categories:
  - Steroids (corticosteroid hormones)
  - Peptide (insulin)
  - Amino acid derivatives (tyrosine, epinephrine, norepinephrine).

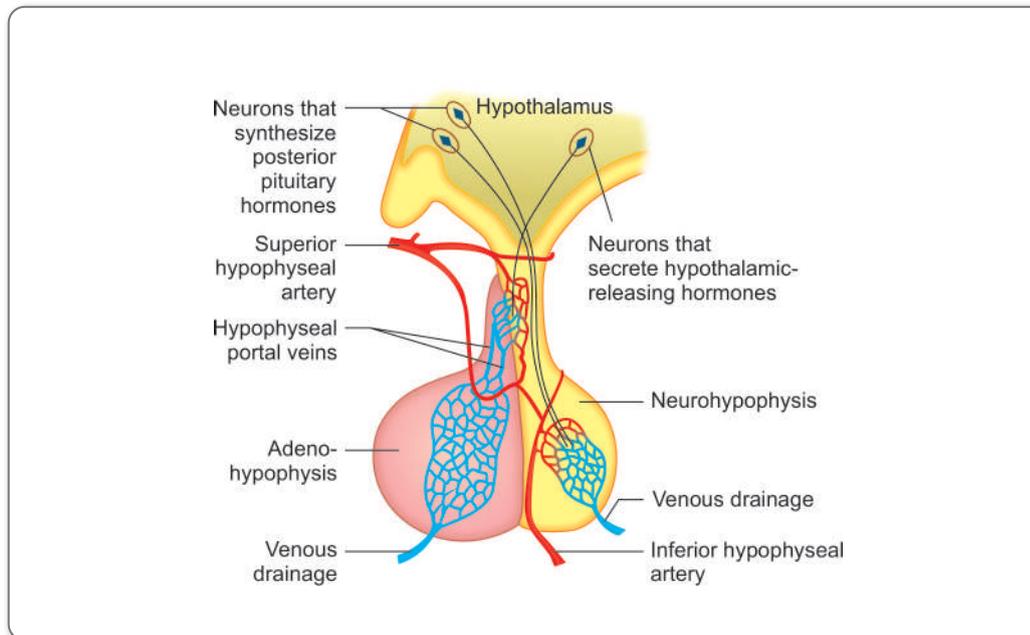


Figure 105: Anatomy of endocrine gland

### Hypothalamus

- Hypothalamus regulates pituitary function.
- Specialized neuron clusters called neurosecretory cells in the hypothalamus produce ADH and oxytocin
- ADH and oxytocin are stored in posterior pituitary.

### Pituitary Gland

- It is known as the **master gland** in the body.
- It is also called as **hypophysis**.
- It is situated in the **dorsal surface of hypothalamus** and is connected to hypothalamus with hypophyseal stalk.
- It has three lobes:
  1. Anterior pituitary (adenohypophysis)
  2. Posterior pituitary (neurohypophysis)
  3. Intermediate lobe



### KEY POINTS

- Endocrine glands are ductless glands.
- Hormones are chemical messengers that are secreted directly into the blood, which carries them to organs and tissues of the body to exert their functions.
- The **hypothalamus** is considered to be a link structure between the nervous and the endocrine system.
- The main function of hypothalamus is to maintain the homeostasis of the body.
- Hunger, sleep, thirst, temperature control and sexual response are under the control of hypothalamus.



### Recent Question (CNCI 2021)

72. The heat regulatory center of the body is located at:

- a. Medulla oblongata
- b. Thalamus
- c. Limbic system
- d. Hypothalamus

Ans. (d) Hypothalamus



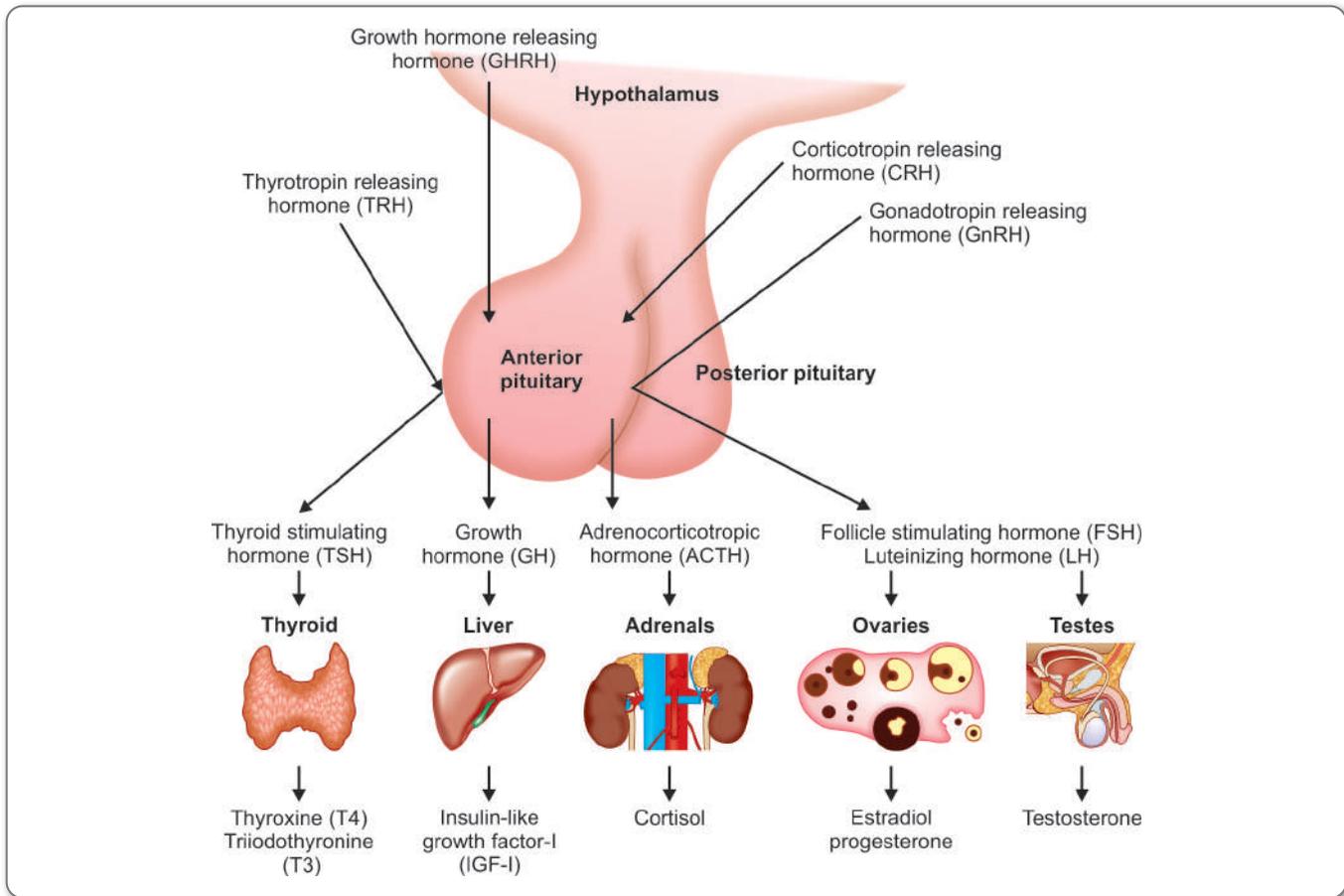


Figure 106: Anterior pituitary hormones and their functions

#### Anterior lobe of the pituitary

- Anterior lobe of the pituitary secretes stimulating hormone in response to releasing hormone from the hypothalamus.
- This lobe secretes and stores hormones such as:
 

■ Growth hormone (GH)	} Hormones
■ Prolactin	
■ Adrenocorticotropic (stimulating) hormone (ACTH)	} Stimulating Hormones
■ Follicle stimulating hormone (FSH)	
■ Thyroid stimulating hormone (TSH)	
■ Luteinizing hormone (LH)	
- Except Growth hormone and prolactin, anterior pituitary hormones are stimulating hormones (Functions mentioned in the figure)

#### Growth hormone (somatotropin)

- It is secreted by anterior pituitary.
- Stimulates growth of all tissues by hypertrophy (increase in cell size) and hyperplasia (increase in number of cells).

#### Prolactin

- Anterior pituitary produces prolactin.

- Lactotrophs cells of anterior pituitary secrete prolactin
- Sucking reflex promotes prolactin secretion and thereby milk production.

#### Melanocyte stimulating hormone.

- Corticotroph cells of the anterior pituitary secrete it.
- Target cells are melanocytes.
- It stimulates melanin production in skin, hair, and eyes which protects the skin from UV radiation.

*Simmonds disease, also known as panhypopituitarism or pituitary cachexia, is a condition characterized by the atrophy or destruction of the entire anterior pituitary lobe. This leads to a significant decrease in the secretion of all hormones normally produced by the anterior pituitary gland.*

#### Posterior Lobe of the Pituitary

- This lobe stores the hormones secreted by hypothalamus.
- Hormones stored include ADH (vasopressin) and Oxytocin.



#### KEY POINTS

- Hyposecretion of growth hormone in children results in **Dwarfism**.
- Hypersecretion of growth hormone in adults results in **acromegaly**.
- Enlargement of pituitary tumor after adrenalectomy is called Nelson's syndrome.



**“He who has health has hope; and he who has hope has everything.”**

**—Arabian proverb**



# CLINICAL CASE-BASED QUESTIONS

*(Including All Topics)*

1

A patient was admitted in surgery ward as a case of abdominal Koch. After the laparotomy surgery, the wound edges are not surgically approximated so that doctor has applied packing over the wound and left for healing. The integumentary continuity is restored by which type of wound healing method?

- a. Primary intentional wound healing
- b. Second intentional wound healing
- c. Third intentional wound healing
- d. First intentional wound healing

**Ans. (b) Second intentional wound healing**

**Explanation:** In the scenario described, where the wound edges are not surgically approximated after a laparotomy surgery and packing is applied, the healing process that occurs is known as second intentional wound healing. This type of wound healing involves allowing the wound to heal by granulation tissue formation from the base of the wound, gradually filling it in and restoring integumentary continuity. The wound is left open and allowed to heal by secondary intention.

2

Vikas, 38-year-old, was admitted in surgical floor with wound over sacral region. The nurse when doing the dressing of the wound observed the bloody drainage. While documenting the procedure the term used by the nurse to denote for bloody discharge:

- a. Serous
- b. Sanguineous
- c. Serosanguineous
- d. Purulent

**Ans. (b) Sanguineous**

**Explanation:** Sanguineous drainage refers to the presence of blood in the wound discharge. It typically has a bright red color and indicates active bleeding. This type of drainage is commonly seen in fresh wounds or wounds with active bleeding.

3

You have received a patient from the OT who has had general anesthesia for major surgery is in the post-operative unit. The patient became conscious and said that he wants to drink some water. Which is the appropriate nursing action?

- a. Check the respiratory rate first
- b. Check the lung sounds
- c. Check the gag reflex
- d. Check the deep tendon reflex

**Ans. (c) Check the gag reflex**

**Explanation:** After general anesthesia, patients may have a decreased gag reflex. This means that they may not be able to protect their airway from aspiration. Before giving a patient anything to drink, it is important to check their gag reflex. This can be done by touching the back of the patient's throat with a tongue depressor. If the patient gags, then they have a gag reflex and it is safe to give them water.

4

While performing the systemic health assessment the nurse has to auscultate the heart sound. Identify which among the following statement is incorrect related to the auscultation point location.

- a. Apical pulse: 5th Intercostal space (ICS) mid-clavicular line left side
- b. Erb's Point: Right of sternal border in 2nd ICS
- c. Aortic: Right of the sternal border in 2nd ICS
- d. Pulmonic: Left of the sternal border in 2nd ICS

**Ans. (b) Erb's Point: Right of sternal border in 2nd ICS**

**Explanation:** “Erb's point” of auscultation for the heart exam, located in the left third intercostal space close to the sternum.

5

A nurse has started the infusion of sodium nitroprusside antihypertensive drug intravenously to a patient for control of severe hypertension. The patient's blood pressure (BP) is unstable and 160/94 mmHg before the infusion. Ten minutes after the infusion, the nurse recorded the blood pressure again and found the patient's BP increases to 180/100 mmHg. Identify the type of response.

- a. Synergistic
- b. Hypersusceptibility
- c. Allergic
- d. Paradoxical

**Ans. (d) Paradoxical**

**Explanation:** A paradoxical response refers to a reaction or outcome that is contrary to what is expected or intended. In this case, the patient's blood pressure increased after the infusion of Sodium nitroprusside, which is an antihypertensive drug used to lower blood pressure.

6

Ravi, a registered nurse, is having his evening duty in cardiac ICU. The team leader has assigned a patient of congestive heart failure (CHF) with history of hypothyroidism to nurse Ravi. While taking the handover from the morning staff nurse Ravi noticed that attended doctor's has mentioned on the patient's file not to take the temperature from the rectal route. Ravi ask to the morning staff the reason of not taking the temperature from rectal in this patient. What statement made by the morning staff is considered to be correct?

- Checking rectal temperature in this case will cause increase in heart rate.
- Checking rectal temperature in this case will cause decrease in heart rate.
- Checking rectal temperature in this case will cause increase in blood pressure.
- Checking rectal temperature in this case will cause increase in pulse rate.

**Ans. (b) Checking rectal temperature in this case will cause decrease in heart rate.**

**Explanation:** Checking the temperature via the rectal route can stimulate the vagus nerve, leading to vagal stimulation. Vagal stimulation can result in a decrease in heart rate, which can be detrimental for patients with CHF.

7

You are working as a day care nurse and posted in the endoscopy room where you have a patient shifted from the nephrology department for the procedure of PEG tube insertion. Select the most appropriate statement related to the insertion of PEG tube.

- PEG tube is inserted into the jejunum through the endoscope.
- A PEG tube exits from the right upper quadrant of the abdomen.
- A PEG tube is inserted with the help of an endoscope through the nose and held in abdomen for feeding purpose.
- A PEG tube is inserted with the help of an endoscope through the mouth and then with the help of guide wire the gastrostomy tube is placed.

**Ans. (d) A PEG tube is inserted with the help of an endoscope through the mouth and then with the help of guide wire the gastrostomy tube is placed.**

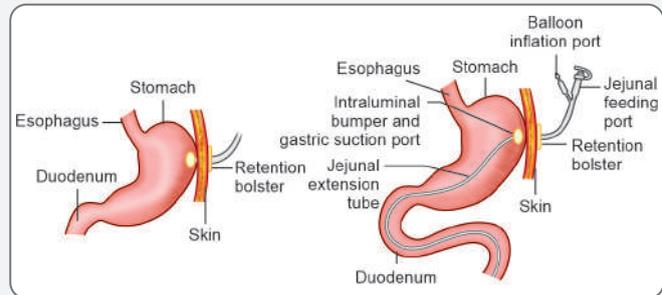
8

A group of nursing students are discussing the case file of the patient in ICU. The students are going through the doctor's progress notes to identify the nutritional status of the patient. They have found one terminology PEG-J under nutritional management. They asked the senior nurse present at nursing station about the full form of PEG-J. Select the best response from the following.

- Percutaneous endoscopic transgastric jejunostomy
- Percutaneous extension gastrostomy and jejunostomy
- Percutaneous entero gastric jejunostomy
- Permanent entero gastric jejunostomy

**Ans. (a) Percutaneous endoscopic transgastric jejunostomy**

**Explanation:** Percutaneous endoscopic transgastric jejunostomy (PEG-J) using large-bore jejunal tubes may help by by-passing gastric passage during enteral nutrition and improving drainage of gastric secretions.



9

Nurse Ramya has assigned to provide care to her patient who is with a chest tube catheter. On assessment of the drainage system, the nurse has observed that there is bubbling in the water seal chamber when the patient breathes. Which among the following is the primary nursing action to be applied by the nurse Rose?

- Inform to the doctor immediately as it is considered as an abnormal finding.
- Check the drainage system for any air leakage.
- Continue to monitor as this is considered as a normal finding.
- Check the drainage system for any tube kink or obstruction.

**Ans. (c) Continue to monitor as this is considered a normal finding.**

**Explanation:** Bubbling in the water seal chamber when the patient breathes is generally considered a normal finding. It indicates that the chest tube is functioning as intended and allows air to escape from the pleural space during expiration. This bubbling is known as tidaling and is expected to occur with respiratory movements.

10

While taking the nursing round you have noticed that one of the patient's chest tube drainage system has disconnected from the chest tube catheter and fallen onto the floor. While the chest tube catheter is secured with sutures and hanging in the air, what would be your priority nursing action?

- Inform the team leader immediately.
- Insert the chest tube catheter tubing 1 inch into a bottle of sterile water and obtain a new system.
- Clamp the chest tube catheter and inform to the doctor.
- Remove the chest tube catheter from the insertion site to reduce the risk of infection.

**Ans. (b) Insert the chest tube catheter tubing 1 inch into a bottle of sterile water and obtain a new system.**

**Explanation:** When a chest tube drainage system becomes disconnected, it is important to maintain a closed system to prevent air from entering the pleural space. By inserting the chest tube catheter tubing into a bottle of sterile water, a temporary seal is created to prevent air from entering the chest cavity. After that,



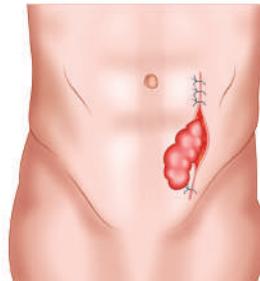
# ? Image-Based Questions (Including All Topics)

1. Identify the disease condition of the GI system shown in the image



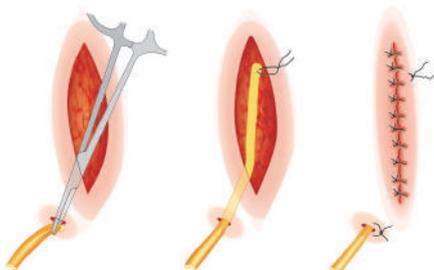
- a. Crohn's disease
- b. Colon cancer
- c. Diverticular disease
- d. Inflammatory Bowel Disease

5. Identify the condition shown in the image



- a. Dehiscence
- b. Enuclation
- c. Evisceration
- d. Extenteration

2. Identify the type of drain used in this image



- a. Tube drain
- b. Penrose drain
- c. Jackson-Pratt drain
- d. Hemovac drain

6. Identify the type of laceration shown in the image



- a. Stretch laceration
- b. Split laceration
- c. Incision tear
- d. Tear laceration

3. Identify the sign shown in the picture



- a. Allen's sign
- b. Chvostek's sign
- c. Trousseau's sign
- d. Tetany

7. Identify the type of suture shown in the image below



- a. Cushing suture
- b. Halsted suture
- c. Lock-Stitch suture
- d. Everting suture

4. Identify the sign that is being elicited to assess for hypocalcemia in this picture



- a. Allen's sign
- b. Chvostek's sign
- c. Trousseau's sign
- d. Tetany

8. Identify the device used to cover the patient. (Refer explanation at the end)



- a. Bair hugger forced air warming blanket
- b. Alpha blanket
- c. Thermal insulation blanket
- d. Top thermal blanket



Ans.

- 1. c
- 2. b
- 3. c
- 4. b
- 5. c
- 6. b
- 7. c
- 8. a

9. Identify the device shown in the image  
(Refer explanation at the end)



- Portable ventilator device
- Bair Hugger warming unit
- Vacuum cleaner
- Alpha bed controller

13. Identify the device shown in the image  
(Refer explanation at the end)



- Ventilator circuit
- Ventilator tube
- HME filter
- Catheter mount

10. Identify the device shown in the image  
(Refer explanation at the end)



- Hemodialysis catheter
- Disposable Blood Pressure Transducer
- Arterial line Catheter
- Double lumen catheter kit

14. Identify the device shown in the image  
(Refer explanation at the end)



- Overhead patient lift
- Overhead Trapeze
- Over head arm support
- Ceiling lift

11. Identify the device shown in the image



- Peritoneal dialysis kit
- Blood Pressure Transducer
- Hemodialysis catheter kit
- Double lumen catheter kit

15. Identify the instrument shown in the image  
(Refer explanation at the end)



- Adenoid curette
- Bone curette
- Universal curette
- Periodontal curette

12. Identify the device shown in the image  
(Refer explanation at the end)



- Peritoneal dialysis kit
- Lumbar Puncture Kit
- Biopsy kit
- Chest drainage insertion kit

16. Identify the name of the equipment shown in the image



- Bain breathing circuit
- Mapleson-C circuit
- McKesson breathing circuit
- Y-type corrugated breathing unit



Ans.

- b
- b
- c
- a
- d
- b
- b
- a

"It is health that is real wealth and not pieces of gold and silver."

—Mahatma Gandhi

## CHAPTER

# 3



# PHARMACOLOGY

## SYNOPSIS

### KEY TERMINOLOGIES

- **Pharmacology:** It is derived from Greek words 'pharmacon' which means drugs and 'logos' which means study or knowledge. It is the scientific study of the origin, nature, chemistry, effects and uses of drugs.
- **Drug/medications:** Any chemical substance which affects living systems. French word 'drogue' means 'dry herb' – used for treatment of disease, for the prevention of illness of pathologic states and for diagnosing disease condition.
- **Chemotherapy: Therapeutic treatment of various local or systemic infections or malignancies by using various drugs or chemicals is called chemotherapy.**
- **Pharmacognosy:** The branch of pharmacology dealing with the economic, biological and chemical aspects of natural drugs and their constituents. Study of the sources of drugs and the physical characteristics of crude or unrefined drugs, e.g., plants.
- **Pharmacodynamics** is the effect that drugs have on the body (what drug does to the body).
- **Pharmacokinetics** is the study of the way in which drugs move through the body during **absorption, distribution, metabolism** and **excretion** (what body does to the drug).
- **Absorption**
  - Physiological considerations in absorption: **Blood flow, total surface area, time of arrival of the drug and time of drug at absorption site.**
  - Other considerations for absorption: **Solubility, chemical stability** and solubility of drug in **lipids.**
- **Distribution**
  - Drugs are distributed, into major body fluids (e.g., plasma).
  - Drug distribution is affected by the extent that the drug binds to plasma proteins and barriers.

- **Biotransformation**
  - It is a process of metabolizing drugs in the body.
  - Occurs mainly in liver.
  - Prodrugs are only activated by the hepatic metabolism e.g., **Levodopa.**
- **Excretion:** Excretion includes renal (by active glomerular filtration and fecal elimination).
- The time of the onset of drug action is determined by the time taken by the drug to reach to the site of action. It is largely controlled by:
  - Route of administration
  - Rate of absorption
  - Manner of distribution.
- **Bioavailability:** It is a measure of fraction of administered drug that reaches the systemic circulation in the unchanged form.
- **First Pass Metabolism:** It is the metabolism of a drug at the site of absorption during its passage from the site of absorption into the systemic circulation. All orally administered drugs undergo first pass metabolism. Drugs administered through sublingual, transdermal and parenteral routes do not undergo first pass metabolism (bypasses portal circulation)
- **Agonist:** These are the drugs which bind to the receptor and produce same biological effect as that of the receptor.
- **Antagonist:** These are the drugs which oppose the action of the receptor or an agonists.
- **Antidote:** A drug which can counteract a form of poisoning, e.g., Atropine is an antidote to organophosphorus poisoning.
- **Lethal Dose 50 (LD50):** Standard measure of the toxicity of a drug/substance that will kill half of the sample population of a specific test animal in a specific period.
- **Pharmacovigilance:** The science and activities relating to the detection, assessment,



### KEY POINTS

- Father of Pharmacology - Oswald Schmiedeberg
- Pharmacokinetics - What the body does to the drug?
- Pharmacodynamics - What the drug does to the body?
- Bioavailability of Intravenous (IV) route is 100%.
- Lipophilic drugs (barbiturates, benzodiazepines) are better absorbed in intestine than hydrophilic drugs.
- The liver is the main drug metabolizing organ in the body.
- The first-pass effect can occur in the gastrointestinal tract, the liver and lung.

understanding and prevention of adverse effects, or any other drug related problem.

- **Teratogenicity:** It is the ability of a drug to produce harmful effect of drugs on fetus when administered during pregnancy.
- **Anaphylaxis:** It is a severe allergic reaction (hypersensitive reaction), which occurs due to ingestion of drugs or any foreign protein material.
- **Antidote:** A drug or chemical substance which counteracts the harmful effects of other drug or chemical.
- **Contraindication:** Any condition or factor, which prevents or withholds the use of a medicine or drug.
- **Emulsion:** It is the mixture of two or more liquids that are normally immiscible (e.g., Mixture of water and oil). Milk is a natural emulsion.
- **Half-life:** It is the period of time required for the concentration of drug in body (usually plasma) to be reduced to one-half. It is one of the major factor influences the duration of action of a drug.
- **Iatrogenic:** Refers to condition or illness, occurs due to the action of physician or therapy. It is the result of diagnostic and or therapeutic procedures undertaken on a patient.
- **Idiosyncrasy:** It is genetically determined abnormal reactivity to a drug.
- **Loading dose:** Administering a drug at a dose higher than the routinely used dose is called as loading dose.
- **Synergism:** Drugs are said to be synergistic when the action of one drug is potentiated or increased by the other. It can be additive or superadditive.
  - **Additive:** Effect of drugs A + B = Effect of drug A + Effect of Drug B. e.g., 1 + 1 = 2
  - **Superadditive:** Effect of drugs A + B > Effect of drug A + Effect of Drug B. e.g., 1 + 1 = 10
- **Antagonism:** Drugs are said to be antagonistic when one drug decreases or abolishes the action of another drug.
- **Pharmacopoeia:** It is the official publication which contains all details about established

drugs, being in a particular country, e.g., Indian Pharmacopoeia (IP), British Pharmacopoeia (BP), United States Pharmacopoeia (USP)

## PRODRUGS

- A prodrug is a medication or compound, which is inactive, that needs to be converted in the body into pharmacologically active drug.

List of prodrugs and their active forms are as follows:

**Table 1:** Active form of prodrug

Prodrug	Active form
Acyclovir	Acyclovir triphosphate
Fluorouracil	Fluorouridine monophosphate
Bacampicillin	Ampicillin
Prednisone	Prednisolone
Sulindac	Sulfide metabolite
Enalapril	Enalaprilat
Alfa-Methyl dopa	Alpha-methyl norepinephrine
Fosphenytoin	Phenytoin

## THERAPEUTIC INDEX (TI)

- It is also called safety margin of a drug. It refers to the ratio between the dosage of a drug that causes a **lethal effect** and the dosage that causes a **therapeutic effect**.
- Therapeutic Index (TI) =  $LD_{50}/ED_{50}$   
Where  $LD_{50}$ : Lethal Dose 50 and  $ED_{50}$ : Effective dose 50
- For the drugs with narrow therapeutic index: Slight deviation from the prescribed dose can be harmful to patients. **Plasma level monitoring is required.**
- For drugs with wide therapeutic index: Usually deviation from prescribed dosage may not be harmful for the patient.

**Table 2:** Therapeutic indices of some common drugs

Very narrow therapeutic index	Narrow therapeutic index	Wide therapeutic index
<ul style="list-style-type: none"> <li>• Vancomycin</li> <li>• Amphotericin</li> <li>• B Polymyxin</li> </ul>	<ul style="list-style-type: none"> <li>• Warfarin</li> <li>• Levothyroxine</li> <li>• Carbamazepine</li> <li>• Lithium Carbonate</li> <li>• Digoxin</li> <li>• Phenytoin</li> <li>• Theophylline</li> <li>• Morphine</li> </ul>	<ul style="list-style-type: none"> <li>• Almost all Antibiotics</li> <li>• NSAIDS</li> <li>• Hypnotics/Sedatives</li> <li>• Beta-blockers</li> <li>• Benzodiazepines</li> </ul>



### Practice Question

1. Prodrugs with two active compounds are known as \_\_\_\_\_

- Mixed prodrugs
- Mutual prodrugs
- Dual prodrugs
- Pro-prodrugs

**Ans. (b) Mutual prodrugs**

**Rationale:** Pro-drugs contains two active pharmacological agents coupled together to form a single product e.g., benorylate prodrug for NSAIDs and paracetamol.



### KEY POINTS

- Prontosil (prodrug for sulfanamide) was the earliest prodrug discovered accidentally.
- A drug which gets bio-transformed rapidly is known as a '**soft drug**'.
- Antibiotics such as Aminoglycosides and vancomycin have a narrow therapeutic index, and toxicity may be severe and irreversible.
- Digoxin has a therapeutic index value of 2. This means 2 doses of digoxin taken at one time have a 50:50 chance of developing toxic side effects.



**IU:** Increased Urine output

**M:** Mother to child (Teratogenicity causing fatal goiter and cardiac anomalies)

- **Side effects of Phenytoin (remember PHENYTOIN)**

**P:** Plasma level monitoring is required

**H:** Hypertrophy of gum and hypersensitivity

**E:** Enzyme inducer, epigastric pain

**N:** Neutropenia

**Y:** Younger patients (hirsutism and acne may occur)

**T:** Teratogenicity

**O:** Osteomalacia

**I:** IV injection causes hypotension and cardiac arrhythmia

**N:** Neurological manifestations (ataxia, vertigo and nystagmus)

- **Side effects of opioids (remember BAD-AMERICANS)**

**B:** Bradycardia and hypotension

**A:** Anorexia

**D:** Depression of respiratory and vasomotor center

**A:** Apnea of newborn

**M:** Mental clouding, miosis

**E:** Euphoria

**R:** Respiratory depression

**I:** Increase smooth muscle activity

**C:** Constipation

**A:** Ameliorate cough reflex

**N:** Nausea and vomiting

**S:** Sedation

- **Uses of benzodiazepines (remember AC-DIAZEPAM)**

**A:** Alcohol withdrawal syndrome

**C:** Conscious sedation

**D:** Diagnostic and minor operative procedure

**I:** Insomnia

**A:** Adjuvant to antiemetic

**Z:** Zia-zag movements of tardive dyskinesia

**E:** Epilepsy

**P:** Preanesthetic medication

**A:** Antianxiety

**M:** Muscles relaxant

- **Drugs increasing potassium levels (remember K-BANK)**

**K:** K<sup>+</sup> sparing diuretics (E.g., Spironolactone)

**B:** Beta-blocker

**A:** ACE inhibitors

**N:** NSAIDs

**K:** K<sup>+</sup> supplement

- **Drugs used in CHF**

**D:** Digitalis (digoxin and digitoxin)

**D:** Dopamine and dobutamine

**D:** Dilators of arterioles and venules (ACE inhibitors and nitrates)

**D:** Diuretics

**D:** Diesterase, amrinone, milrinone



## Golden Points to Remember

Wanna Listen & Recall these  
200+ Golden Points in Podcast Form  
Access Target High Digital Lite in Nursing Next Live App



Listen & Recall

## Golden Points



- Oswald Schmiedeberg (1838–1921) is generally recognized as the founder of modern *pharmacology*.
- *Pharmacology* is a branch of science that deals with the study of drugs and their actions on living systems.
- The study of poisons, their actions, detection, prevention and the treatment of poisoning is known as toxicology.
- Pharmacopoeia is a book containing formulas and information that provide a standard for preparation and dispensation of drugs.
- Pharmacokinetics is the study of what the body does to the drug. It includes absorption, distribution, metabolism and excretion.
- Pharmacodynamics is the study of what the drug does to the body. It includes receptor, enzymes, ion channels, immune system, etc.
- Protein binding of a drug helps in prolonging half-life, distribution and limiting metabolism
- An **enteric coating** is a polymer barrier applied to oral medication that prevents its dissolution or disintegration in the gastric environment.
- Film coatings **are** very thin layers of a safe ingredient placed around the **tablet to** again protect the tongue from the flavor of the contents and protect the contents from moisture and light.
- **An aqueous solution of sucrose containing added medicinal substances is known as syrup**
- **A liquid consisting of undissolved particles of one or more medicinal agents mixed with a liquid vehicle for oral administration, is known as suspension. Shake well before use**
- **A liquid containing a drug with syrup, glycerine, or alcohol added to mask its unpleasant taste is known as Elixir.**
- Essential medicines are those that satisfy the priority health care needs of the population.
- Inactive drug which gets activated in the body to an active form is known as 'Prodrug.'
- Drugs mostly cross biological membranes by passive diffusion.
- *Bioavailability* is defined as the fraction (percentage) of an administered dose of unchanged medicine that reaches the systemic circulation.
- Drugs given by *intravenous route* have 100% bioavailability since they avoid the hepatic *first-pass effect*.
- Drugs administered through sublingual, transdermal and parenteral routes do not undergo first pass metabolism (bypasses portal circulation).
- Oral route of administration has high first pass metabolism than other routes.
- BCG, Mantoux and Drug sensitivity tests are administered intradermally. The needle is inserted at 15-degree angle.
- **Appropriate site for administering iron injection (Dextran) is Dorsogluteal muscle**
- **The maximum volume of a drug that can be injected through intramuscular injection is 5 ml.**
- Hydrophilic substances can permeate membranes by active transport and not by passive diffusion.
- **The most important route of excretion of drugs is through Kidney.**
- *Orphan drugs* are medications or other medicinal products used to treat rare diseases or disorders.
- An agonist is a drug that binds to the receptor, producing a similar response to the intended chemical and receptor.
- An antagonist does the opposite of an agonist. It binds to receptors, and stops the receptor from producing a desired response.
- Additive interaction means the effect of two drugs is equal to the sum of the effect of the two drugs taken separately.



Contd...

# ? Image-Based Questions

1. Which of the following is incorrect regarding the device in the picture?  
(Refer explanation at the end)



- a. Requires coordination with inspiration
- b. Easier to maneuver
- c. Known as dry powder inhaler
- d. Insulin can be used

5. DOC for Poisoning due to Substance produced by Plant shown in Photograph is: [Recent Question 2013]



- a. Pyridoxine
- b. N-acetylcysteine
- c. Prazosin
- d. Naloxone

2. The most important component of the anesthetic machine component given in the picture is:  
(Refer explanation at the end)



- a. Calcium hydroxide
- b. Potassium hydroxide
- c. Sodium hydroxide
- d. Water

6. DOC for Poisoning due to Sting of Arthropod animal shown in Photograph is:



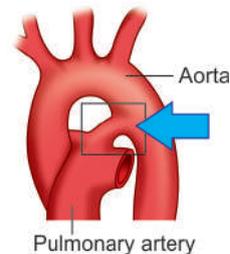
- a. Esmolol
- b. Adrenaline
- c. N-acetyl cysteine
- d. Prazosin

3. The test done in the picture is to test the patency of:  
(Refer explanation at the end)



- a. Ulnar artery
- b. Radial artery
- c. Ulnar vein
- d. Radial vein

7. DOC for Congenital condition (Arrow) shown in the Photograph is:



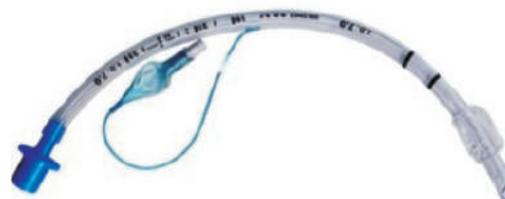
- a. Aspirin
- b. Indomethacin
- c. Nimesulide
- d. Propranolol

4. DOC for Poisoning due to Food item shown in the Photograph is: [Recent Question 2014]



- a. Hyoscine
- b. Propranolol
- c. Phenylephrine
- d. Atropine

8. Muscle relaxant of choice for Use for instrument shown in Photograph is:



- a. Pancuronium
- b. Roxacurium
- c. Succinylcholine
- d. Atracurium

## Ans.

- 1. a
- 2. a
- 3. a
- 4. d
- 5. d
- 6. d
- 7. b
- 8. c

“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### KEY TERMINOLOGIES IN PHARMACOLOGY

1. Unwanted but unavoidable pharmacodynamic effects of a drug at therapeutic dose is known as:

- a. Hypersensitivity
- b. Toxic effects
- c. Side effects
- d. Idiosyncrasy

**Explanation:** Side effects are undesired but often unavoidable pharmacodynamic effects that occur at therapeutic dose. Idiosyncrasy refers to individual's peculiar sensitivity to a drug. Drug intolerance is defined as a lower threshold to the normal pharmacologic action of a drug.

2. A drug can: (ESIC Chennai May 2012)

- a. Diagnose disease
- b. Cure disease
- c. Prevent disease
- d. All of these

3. Pharmacodynamic includes:

- a. Drug elimination
- b. Drug excretion
- c. Drug absorption
- d. Mechanism of action

4. Loading dose of a drug is given:

- a. To achieve high concentration in short time
- b. For rapid onset of action
- c. To avoid complication
- d. To minimize side effects

**Explanation:** Loading doses of drugs are typically administered to achieve a high concentration of the drug in the body quickly. This is done to attain rapidly a therapeutic level of the drug, especially in cases where immediate action or relief is required. By providing a larger initial dose, the drug quickly reaches the desired concentration in the body, ensuring a more rapid onset of action.

5. The maximum effect of a drug is defined by:

- a. Therapeutic index
- b. Potency
- c. Efficacy
- d. Adversity

6. Drugs used for rare disease are known as:

- a. Orphan drugs
- b. Rare drugs
- c. Over the counter drugs
- d. Emergency drugs

7. Which of the following is true of placebo?

- a. Placebo is a dummy medication
- b. Placebo is the inert material added to drug for making
- c. Placebo is an additive added with the drug during manufacturing
- d. All patients respond to placebo

**Explanation:** A placebo is an inactive substance or treatment that is designed to resemble a real medication or intervention. It does not contain any active ingredients that directly treat the condition or symptoms being addressed. Placebos are commonly used in medical research as a control group to assess the efficacy of a new treatment.

8. The substances derived from living organisms that are used to kill or prevent the growth of bacteria is known as:

- a. Antibiotics
- b. Antidotes
- c. Antihistamines
- d. Antipyretics

9. Drugs used to reduce the increased temperature of the body are called as:

- a. Antibiotics
- b. Analgesics
- c. Antipyretics
- d. Antihistamines

10. Drugs used to relieve pain are known as:

- a. Antibiotics
- b. Analgesics
- c. Antipyretics
- d. Antihistamines

11. Drugs which increase urinary excretion is known as:

- a. Antidiuretics
- b. Diuretics
- c. Laxatives
- d. Vasopressin

12. Which of the following is an example of urinary antiseptic?

- a. Cresol
- b. Furosemide
- c. Nitrofurantoin
- d. Hypochlorite

13. Drug used to treat itching is known as:

- a. Analgesic
- b. Anti-infective
- c. Antispasmodic
- d. Antipruritic

14. Severe allergic reaction to a drug is known as:

- a. Anaphylaxis
- b. Adverse effect
- c. Drug interaction
- d. Toxicity

**Explanation:** Anaphylaxis is an allergic reaction to an antigen (e.g., an antibiotic) to which the body has become hypersensitive. It typically causes a number of symptoms including an itchy rash, throat swelling and low blood pressure.

15. Substances used to counteract the effects of poison are called as:

- a. Antibiotics
- b. Anticholinergics
- c. Antiemetics
- d. Antidotes

16. The ability of the drug to cause foetal damage is called as:

- a. Amniotic
- b. Fetotoxic
- c. Ototoxic
- d. Teratogenicity

17. Teratogenicity refers to:

- a. Toxic action on the liver
- b. Toxic action on fetus
- c. Toxic action on blood system
- d. Toxic action on kidneys

**Explanation:** Teratogenic drugs crosses placental barrier and cause damage to the growth and development of fetus.

18. Cholagogues are drugs used to:

- a. Increase the amount of secretion of bile
- b. Increases peristalsis
- c. Treat flatulence on tissues and arrest secretions
- d. Inhibit peristalsis



### Ans.

- 1. c
- 2. d
- 3. d
- 4. a
- 5. c
- 6. a
- 7. a
- 8. a
- 9. c
- 10. b
- 11. b
- 12. c
- 13. d
- 14. a
- 15. d
- 16. d
- 17. b
- 18. a

**19. Astringents are drugs used:**

- As cosmetics
- Reduce bleeding from minor abrasions
- To arrest secretions
- All of the above

**DOSAGE FORMS****20. Glucose is added in ORS to:**

- Improve taste
- Decrease bacterial colonization of GIT
- Increase the stability
- Increase the absorption of sodium

**Explanation:** Glucose is added to ORS to increase the absorption of sodium. This is because glucose and sodium are absorbed together in the small intestine through a process called cotransport. When glucose is present, it helps to pull sodium into the bloodstream, which helps to rehydrate the body.

**21. Age-appropriate dosage form for a 7-year-old boy to administer antibiotic as the treatment for his ear infection is:**

- Tablet
- Capsule
- I.M Injection with 20 g needle
- Oral suspension

**Explanation:**

- Oral suspensions are a liquid form of medication that is easy to swallow and can be flavored to make it more palatable for children. They are also a good choice for children who have difficulty in swallowing tablets or capsules.
- Tablets and capsules may be difficult for young children to swallow, especially if they have not yet developed the necessary coordination and swallowing skills.
- Injections with a 20 g needle are typically administered intramuscularly (IM) and are generally not the preferred route especially if oral alternatives are available.

**22. Which of the following dosage form does not dissolve in the stomach?**

- Hard capsule
- Soft capsule
- Enteric coated tablet
- Film coated tablet

**Explanation:** An **enteric coating** is a polymer barrier applied to oral medication that prevents its dissolution or disintegration in the gastric environment. Film coatings are very thin layers of a safe ingredient placed around the **tablet** to again protect the tongue from the flavor of the contents and protect the contents from moisture and light. Due to its large size, sugar coatings are largely replaced by film coating to mask the unpleasant odor/taste of the drug.

**23. Which of the following dosage form is best suitable in a medical emergency where a centrally acting rapid action is required?**

- S.C. injection
- Transdermal patch
- I.V. Injection
- I.M. Injection

**Explanation:** IV route of administration is the fastest route and bypasses absorption barriers and first-pass metabolism. It is used when a rapid effect is required in continuous administration and in large volumes.

**24. A liquid containing a drug with syrup, glycerine, or alcohol added to mask its unpleasant taste is known as:**

- Lotion
- Syrup
- Elixir
- Suspension

**25. A liquid consisting of undissolved particles of one or more medicinal agents mixed with a liquid vehicle for oral administration is known as:**

- Suspension
- Elixir
- Syrup
- Lotion

**26. An aqueous solution of sucrose containing added medicinal substances is known as:**

- Elixir
- Suspension
- Syrup
- Lotion

**Explanation:**

Syrup	Elixir	Suspension
<ul style="list-style-type: none"> <li>Syrup is concentrated, viscous, aqueous solution of sugar or a sugar substitute with or without medicinal substances (Drug)</li> <li>Syrups are thicker and vicious than Elixirs</li> </ul>	<ul style="list-style-type: none"> <li>Elixirs are clear and pleasantly flavored solution with or without medicinal substance (drug)</li> <li>Primary solvents are alcohol and water</li> </ul>	<ul style="list-style-type: none"> <li>Suspensions are liquid dosage forms containing finely divided insoluble materials</li> <li><b>Shake well before use</b></li> </ul>

**PRODRUGS****27. A medication which is metabolized and converted into a pharmacologically active drug after administration is known as:**

- Active drug
- Prodrug
- Premetabolite
- Placebo

**28. Which of the following is a prodrug?**

- Captopril
- Enalapril
- Phenytoin
- Ampicillin

**Explanation:** A prodrug is a medication or compound that, after administration, is metabolized into a pharmacologically active drug. Enalapril maleate is a prodrug which when administered orally is hydrolysed to release the active converting enzyme inhibitor enalaprilat. Enalapril maleate is 60% absorbed and 40% bioavailable as enalaprilat.

**29. All of the following are prodrugs; EXCEPT:**

- Allopurinol
- Levodopa
- Oxazepam
- Prednisone

**Ans.**

- d
- d
- d
- c
- c
- c
- a
- c
- b
- b
- c

“A person cannot accumulate a fortune very well when he is sick.”

—P. T. Barnum

CHAPTER

4



# COMMUNITY HEALTH NURSING

## SYNOPSIS

**Community:** A group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings.

**Community health nursing:** Community health nursing is a synthesis of nursing practices and public health practices applied in promoting and preserving the health of population.

### CONCEPTS AND DETERMINANTS OF HEALTH AND WELL-BEING

#### Concepts of Health

**Health:** It is a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity (WHO 1948).

Following are the changing concepts of health:

- **Biomedical concept:** This has been viewed that health is an absence of disease and if one was free from disease then the person was considered as healthy. This concept has its basis in germ theory.
- **Ecological concept:** This has been viewed that health is a dynamic equilibrium between man and his environment and disease is maladjustment of the human being to the environment.
- **Psychosocial concept:** According to this concept health is influenced by social, psychological, cultural, economic and the political factors.

#### Determinants of Health

**Table 1:** Factors of determinants of health

Determinants	Factors
Biological	Genetic make-up, Growth and Development
Behavioral and sociocultural conditions	Life style, personal habit (smoking, drinking), nutritional status, sleep pattern, physical activity

- **Holistic concept:** This model is a synthesis of all the above concepts. It recognizes the strength of social, economic, political and environmental influences on health. This approach implies that all sectors of society have an impact on health.

#### Dimensions of Health

- Physical dimension
- Mental dimension
- Social dimension
- Spiritual dimension

#### Concept of Disease

- A condition in which body function is impaired.
- A maladjustment of human to the environment.

#### Causes

- Supernatural causes and karma
- Theory of humors (fluid)
- Theory of contagion
- Germ theory
- Epidemiological triad
- Multi-factorial causation
- Web of causation

**Disease:** Biological concept-physiological/ psychological dysfunction

**Illness:** Socio-pathological concept-subjective feeling of not being well.

**Sickness:** Biological concept of social dysfunction



#### KEY POINTS

- The three features of a community are **location, population and social system.**
- England is the first country to start Concept of Healthcare and Public health.
- In 1861, Louis Pasteur published his germ theory which proved that bacteria caused diseases.
- The father of modern public health is 'John Snow' for his pioneering investigations on Cholera epidemics.
- Fastigium stage is the highest point of disease or illness.



#### KEY POINT

Public health science Era (1950-75): Integration of social science and public health sciences took place. It is being called era of Community-centered approach.

Contd...

Determinants	Factors
Environment	<b>Internal environment:</b> Each and every body tissue and its functioning <b>External environment (macro environment):</b> All that external to the individual and can be divided as physical, biological, chemical and psychosocial <b>Domestic environment (micro environment):</b> Way of living and lifestyle such as eating habits, smoking, drinking, use of drugs, etc.
Socioeconomic conditions	Per capita GNP, education, nutrition, employment, housing, political system of country and occupation
Health services	Affordability, Accessibility and Availability of healthcare services, e.g., Access to and availability of vaccination
Aging of the population	Major concern of rapid population aging is the increased prevalence of chronic diseases and disabilities
Gender	Many programs have been established for female empowerment that focus on nutritional and reproductive health among females
Other factors	Factors such as revolution in information and communication also help us to access good health

### Concept of Well-Being

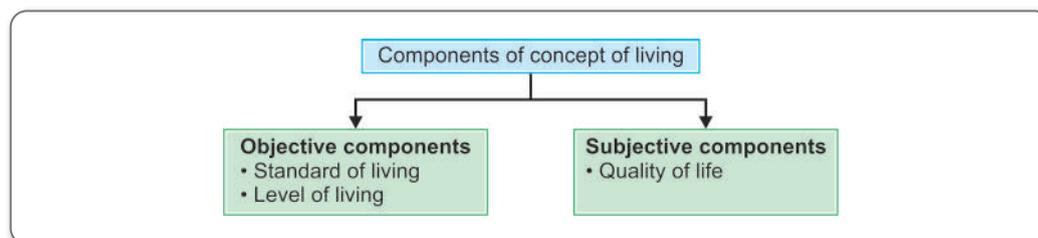


Figure 1: Concept of well-being

PQLI: Physical quality of life index

HDI: Human development index

#### Three indicators of human development index:

1. Life expectancy index
2. Education index
3. CNI index.

### INDICATORS OF HEALTH

#### Indicators of Health or (Health Index/Indices)

Indicators are required not only to measure the health status of the community but also to compare the health status of one country with that of another, for the assessment of healthcare needs, for allocation of scarce resources and for monitoring and evaluation of health service activities and programs.

- **Health Indices:** It is a plural form of health index (indicator)

### Mortality and Morbidity Indicators

Mortality indicators	<ul style="list-style-type: none"> <li>• Crude Birth Rate</li> <li>• Crude Death Rate</li> <li>• Maternal Mortality Rate</li> <li>• Neonatal Mortality Rate</li> <li>• Infant Mortality Rate</li> <li>• Under-five mortality Rate</li> <li>• General fertility rate</li> <li>• Life expectancy at birth</li> <li>• Age specific death rates</li> <li>• Under 5 proportionate mortality rate</li> <li>• Disease specific death rate</li> <li>• Case fatality rate</li> <li>• Year of potential life lost</li> </ul>
Morbidity indicators	<ul style="list-style-type: none"> <li>• Incidence</li> <li>• Prevalence</li> <li>• Notification rate</li> <li>• Admission, Discharge or Readmission rate</li> <li>• Attendance rate of OPD of health center</li> <li>• Duration of stay in the hospital</li> <li>• Absence from work or duty</li> </ul>

### Recent Question (NORCET 2022)

1. PQLI (The Physical Quality of Life Index) is all, except:
- a. Life expectancy at one year of age
  - b. Literary rate
  - c. IMR
  - d. Income
- Ans. (d) Income**

### KEY POINTS

- Barometer of social welfare is 'Tuberculosis'
- Disability Adjusted Life Years (DALY) = Years of life lived with disability (YLD) + Years of Life Lost due to disability (YLL)
- Sullivan's index = Life expectancy - years of life lived with disability (YLD) = Expectation of Life free of disability

IMR = the number of deaths in the first year of life/the number of live births in the same year X 1000.

### POINT TO REMEMBER

Infant Mortality Rate (IMR) is the most universally accepted indicator of health status of the whole population





## Golden Points to Remember

- The world health day is celebrated on **April 7<sup>th</sup>**.
- World Tuberculosis day is celebrated on **March 24<sup>th</sup>**.
- World AIDS day is celebrated on **1st December**.
- Prevention of risk factors refers to primordial prevention. Example: Lifestyle modification.
- **Immunization and fortification of food** with specific nutrients are an example of **primary prevention**.
- Wearing seat belts, safety helmets and other safety equipment are the examples of **primary health promotion behavior**.
- Early diagnosis (screening) and primary treatment (basic treatment) of the disease are known as **secondary prevention**.
- Medical therapy (hospital care), surgical treatment and rehabilitation are the examples of **tertiary level prevention**.
- The ideal **weight** of an adult person is calculated on the basis of **height**.
- **Incidence** is defined as the number of new cases that occur over a given period of time.
- **Prevalence** is the number of cases (old + new cases) in a population in a given period of time.
- **Point prevalence** is defined as proportion of population which has condition in specific point in time.
- **Period prevalence** is defined as proportion of a population which has the condition at some point of time during the given period.
- A sudden outbreak of disease in the community in excess than the normal expectation is known as **epidemic**.
- **Pandemic**: When an epidemic spreads out throughout the world (worldwide).
- **Endemic**: A disease that exists permanently in a particular geographical region or population.
- **Entomology** is a scientific study of insects, a branch of zoology.
- The WHO initiative 'Right to Sight' is named as **Vision 2020**. It is a global initiative for the elimination of avoidable blindness.
- India is currently in late expanding stage (third stage) of demographic cycle. In this stage, birth rate begins to decline and death rate further decreases (from 2<sup>nd</sup> stage).
- **Sex ratio** is defined as the number of female individuals for every 1000 male individuals.
- **General fertility rate** refers to number of live births per 1000 females in reproductive age group.
- **Mass drug administration** is given to control filaria and malaria in many countries but in India it is done in case of lymphatic filaria only.
- The content of Drug Kit A provided at subcenter includes ORS, tablet iron and folic acid, vitamin A solution and tablet cotrimoxazole.
- The population covered by the primary health center is 30,000 in plain areas and 20,000 in tribal area.

Wanna Listen & Recall these  
150+ Golden Points in Podcast Form  
Access Target High Digital Lite in Nursing Next Live App

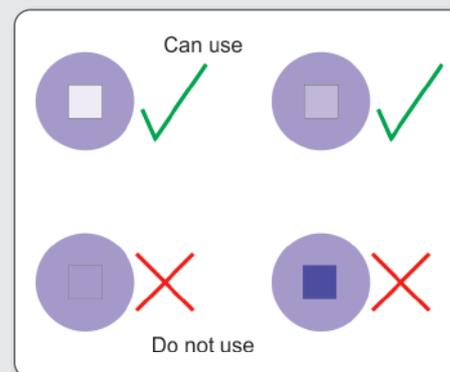


Listen & Recall

Golden Points



- **Bhore Committee** (1946) is known as **Health Survey & Development Committee**.
- **Mudaliar Committee** (1962) is known as **Health Survey & Planning Committee**.
- One **basic health worker** for 10,000 population was recommended by **Chadha Committee (1963)**.
- **Kartar Singh Committee (1973)** recommended that ANMs were to be converted to MPW (F).
- The **Rural Health Scheme** was based on the recommendation of **Srivastava Committee**.
- MPWs (multipurpose worker) team include one male health worker and one female health worker which cover 5,000 population in rural areas.
- The new-born birth to be registered in India within 21 days of birth.
- **UNICEF (United Nation International Emergency fund)** was established in 1946.
- **Telemedicine hub** refers to the primary clinical site from where the health provider renders health services to the remote places.
- Antiviral agents used for prevention and treatment of **swine flu** are Oseltamivir (Tamiflu) and Zanamivir (Relenza).
- A **characteristic** feature of the rash in **chicken pox** is its **pleo-morphism** (all stages of rash may be seen simultaneously).
- India was free from smallpox in April 1977 but it was officially declared in December 1979.
- Smallpox was officially declared eradicated by the World Health Organization (WHO) on 8<sup>th</sup> May, 1980.
- **BCG, Hepatitis B, OPV** vaccines are recommended at birth according to National Immunization Schedule.
- The system of storing and transporting vaccines is termed as Cold chain.
- The vaccination can be used if the center square is white in the Vaccination Vial Monitor (VVM).



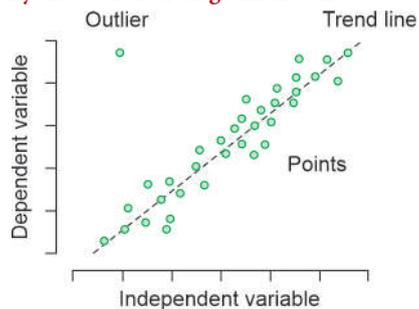
- **Oral Polio Vaccine (OPV)** is live vaccine (Sabin) and **Inactivated Polio Vaccine (IPV)** is a killed vaccine (Salk).
- The diluent used for reconstitution of BCG vaccine is normal saline.

Contd...



# ? Image-Based Questions

1. Identify the statistical diagram shown



- a. Ogive chart                      b. Scatter plot  
c. Dot matrix                        d. Histogram

5. Identify the disease for which program is depicted in symbol.



- a. Iodine deficiency  
b. Non-communicable diseases, cancer, diabetes  
c. Deafness  
d. Road traffic accidents

2. Identify the medication in the strip.



- a. DOTS Category I                      b. DOTS Category II  
c. MDT Kit for Leprosy                      d. Combined OCP

6. Services provided at facility shown in symbol:

[Recent Question 2014]



- a. DOTS services  
b. HIV Counselling  
c. RTI/STI services  
d. First aid services

3. The type of Copper-T shown in the image is:



- a. Cu T 200                                      b. Cu T 375  
c. Cu T 380 A                                      d. Nova-T

7. The logo shown in the picture belongs to:



- a. Ayushman Bharat                                      b. National Green Tribunal  
c. Jan Dhan Yojana                                      d. Atal Pension Yojana

4. Identify the national health program depicted.



- a. Rashtriya Swasthya Suraksha Karyakram  
b. Rashtriya Bal Swasthya Karyakram  
c. Rashtriya Kishor Swasthya Karyakram  
d. Navjat Shishu Suraksha Karyakrama

8. The logo shown in the picture indicates:



- a. Ayushman Bharat                                      b. NRHM  
c. Jan Dhan Yojana                                      d. Atal Pension Yojana



Ans.

1. b  
2. d  
3. b  
4. c  
5. c  
6. c  
7. a  
8. c

“Man needs difficulties; they are necessary for health.”

—Carl Jung



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### CONCEPTS AND DETERMINANTS OF HEALTH & WELL-BEING

1. **Quality and quantity of an individual's inter-personal ties and extent of involvement with the community is known as:** (AIIMS BPL NO 2018)

- Mental dimension of health
- Physical dimension of health
- Spiritual dimension of health
- Social dimension of health

**Explanation:** Social dimension is related to social well-being that creates integration and adjustment with the individual and community. Mainly it is defined the quality and quantity of an individual's inter-personal ties and extent of involvement with the community.

2. **The functions of community are:** (AIIMS Raipur Grade II 2017)

- It provides space for socializing and recreation
  - It provides safety and security
  - Socialization and Education for its members
  - Provides opportunity for interaction among members
- a. a, b, c                      b. b, c, d  
c. a, c, d                      d. a, b, c, d

**Explanation:** The functions of community include socialization, social control, social participation and mutual support

3. **Ageism is characterized by:**

- Denial of negative stereotypes regarding aging
- Positive attitude towards the elderly based on age
- Negative attitude towards the elderly based on age
- Negative attitude towards the elderly based on physical disability

4. **Entomology is the science that studies:** (RRB SSNE 2015)

- Behavior of human beings
- Insects
- Behavior of ants
- Formation of rocks

5. **Head Quarters of World Health Organization (WHO) is situated at:**

- New York, United States of America
- London, England
- Geneva, Switzerland
- Paris, France

6. **The concept of health which emphasizes that health is a 'sound mind in a sound body in a sound family in a sound environment' is:** (AIIMS Bhopal Grade-I 2018)

- Ecological concept
- Physical concept
- Psychological concept
- Holistic concept

**Explanation:** The health has been described by various scientists according to their concept of viewing the health. The ecologist viewed health as a harmonious equilibrium between man and environment. The physical concept of health describes health as a state of well-functioning of the body and psychological concept describes health as absence of mental illness. The Holistic concept of health is viewed as a multidimensional process involving well-being of the whole person in the context of his environment

7. **The World Health Day is observed on:**

- 7th April
- 4th May
- 17th August
- 1st December

**Explanation:** The World Health Organization observes World Health Day on 7th of April every year.

8. **The subjective component of well-being is referred to as:**

- Physical quality of life
- Quality of work
- Quality of life
- Standard of living

**Explanation:** Subjective well-being is called as quality of life.

9. **Health means absence of disease is the concept of:**

- Biomedical
- Ecology
- Holistic
- Psychosocial

**Explanation:** Health means absence of disease is the biomedical concept.

10. **What is the theme for 2016 world health day?**

- Halt the rise: Beat diabetes
- Food safety
- Vector-borne diseases: Small bite, big threat
- Healthy heart beat, Healthy blood pressure

**Explanation:**

- 2016: Halt the rise: Beat diabetes
- 2015: Food safety
- 2014: Vector-borne diseases: Small bite, big threat
- 2013: Healthy heart beat, Healthy blood pressure

11. **Forerunner of modern public health is:** (JIPMER 2012)

- Phoebe
- John Snow
- Serelette
- Louis Pasteur



Ans.

- d
- d
- c
- b
- c
- d
- a
- c
- a
- a
- d

12. Which of the following is not a method of health promotion; EXCEPT:

- a. Behavioral modification
- b. Lifestyle modification
- c. Immunization
- d. Nutritional education

13. One characteristic of the integrative model of health care is:

- a. Increased cost
- b. A focus on physical disease states
- c. An integration of mind-body-spirit
- d. The plan of care is directed by the health care provider

14. WHO definition of health is:

- a. Complete absence of disease
- b. Physical and mental well-being
- c. Complete physical, mental and social well-being not merely the absence of disease or infirmity
- d. Complete physical, mental, psychological and social well-being

## INDICATORS OF HEALTH

15. All of the following components are used in Kuppuswamy classification of socio-economic status; EXCEPT:

- a. Family income
- b. Education
- c. Occupation
- d. Number of children

**Explanation:** Component of Kuppuswamy scale includes education, occupation and income. Kuppuswamy classification is used in urban and periurban areas which consider the education of the head of family, occupation of head of the family and per capita monthly income.

16. The process of continuous progressive improvement of the health status of a population is:

- a. Block development
- b. Community development
- c. Health development
- d. Society development

**Explanation:** Health development is the progressive improvement of health status of a population.

17. Ongoing measurement of performance of a health service refers to:

- a. Evaluation
- b. Monitoring
- c. Scrutinization
- d. Surveillance

**Explanation:** Ongoing measurement of performance of health services is known as surveillance.

18. Human Development Index (HDI) does not include:

- a. Mean Years of schooling
- b. Life expectancy at birth
- c. Real GDP per capita
- d. Adult literacy rate

19. The value of Human Developmental Index in India is:

- a. 0.500
- b. 0.586
- c. 0.505
- d. 0.540

20. Nursing interventions directed at health promotion in the older adult are primarily focused on:

- a. Disease management
- b. Controlling symptoms of illness.
- c. Teaching positive health behaviors
- d. Teaching regarding nutrition to enhance longevity

**Explanation:** Nursing interventions directed at health promotion in the older adult are primarily focused on teaching positive health behaviors. These interventions aim to empower older adults to take control of their health and make choices that promote well-being and prevent illness. By providing education and guidance on topics such as exercise, healthy eating, stress management, and preventive screenings, nurses can help older adults adopt and maintain healthy habits that enhance their overall health and quality of life.

21. Most important health status indicator of a country:

- a. Life expectancy at birth
- b. Maternal mortality rate
- c. Total fertility rate
- d. Infant mortality rate

**Explanation:** Life expectancy at birth is considered the most important health status indicator of a country. It provides an overall measure of the average number of years a person is expected to live from birth, taking into account factors such as healthcare, living conditions, and socioeconomic factors.

22. Which one of the following is not a socio-economic indicator?

- a. Literacy rate
- b. Family size
- c. Housing
- d. Life expectancy at birth

## LEVELS OF HEALTHCARE & HEALTH FOR ALL

23. Philosophy of Primary Health Care are as follows; EXCEPT:

- a. Equity and justice (ESIC 2019)
- b. Intersectoral approach
- c. Primary prevention
- d. Inter-relationship of health and development

**Explanation:** Philosophy of Primary Health Care is based on the values of equity, social justice, solidarity, Intersectoral approach and inter-relationship of health and development, Further, at its core is a focus on population health, illness prevention, and health promotion.

24. The principles of primary health care include:

(AIIMS Raipur Grade II 2017)

- a. Equitable distribution
  - b. Community participation
  - c. Coverage and accessibility
  - d. Appropriateness and continuity
- a. a, b, c
  - b. b, c, d
  - c. a, c, d
  - d. a, b, c, d

**Explanation:** The principles of primary health care include intersectoral coordination, appropriate technology, equitable distribution and community participation.

25. The following are the functions of male health Workers as a Health Team member; EXCEPT:

(AIIMS Raipur Grade II 2017)

- a. Conduct survey of the Sub center and maintain record of all families
- b. Provide nutrition advice and Immunization to mothers and Children
- c. Maintain information of all vital events
- d. Promote health education activities



Ans.

- 12. c
- 13. c
- 14. c
- 15. d
- 16. c
- 17. d
- 18. d
- 19. b
- 20. c
- 21. a
- 22. d
- 23. c
- 24. a
- 25. b

“Keep your vitality. A life without health is like a river without water.”

—Maxime Lagacé

## CHAPTER

# 5



# PSYCHIATRIC NURSING

## SYNOPSIS

### INTRODUCTION

- **Mental health nursing** is a specialized area of nursing practice that deals with promotion of mental health, prevention of mental illness, care and rehabilitation of mentally ill individuals both in hospital and community.
- In **1943**, mental health nursing course was first started for male nurses.
- In **1965**, **Indian Nursing Council** included psychiatric nursing as a compulsory course in the BSc Nursing program.
- In **1967** **TNAI**, formed a separate committee for mental health nursing to improve the perception of mental health nursing as well as to set guidelines for nursing teachers to conduct theory classes and clinical training in psychiatric nursing.
- In **1976**, **Masters in Psychiatric Nursing** was first started at **RAK College of Nursing, New Delhi**.

### MENTAL HEALTH

- Mental health is an adjustment of human beings to the world and to each other with maximum effectiveness and happiness.
- Mental health is an equilibrium of body, mind and spirit with the environment.

### MENTAL ILLNESS

- Mental illness is maladjustment in living. It produces a disharmony in the person's ability to meet human needs comfortably or effectively and to function within a culture.
- Mental illness is health condition involving changes in emotion, thinking and behavior (or a combination of these).

### Mental Healthcare Act 2017

- The **Indian Mental Healthcare Act 2017** replaced the Mental Health Act 1987.
- **Mental Healthcare Act 2017 (MHA 2017)** received presidential consent on **April 7<sup>th</sup>, 2017** and **replaced** the **1987 Act**.

### Salient Features of MHA 2017

- **Decriminalization of suicide attempt:** This Act has overturned **309 Indian Penal Code**. The MHA 2017 decriminalizes suicide attempt by mentally ill person.
- **Rights of persons with mental illness**
  - Every person will have the right to access mental healthcare services.
  - Protect person with mentally ill from inhuman treatment.
  - Mentally ill patients to have access to free legal services and right to complain about shortcoming of provision of treatment.
  - **Advance directive:** Empowers a mentally ill person to have the right to make an advance directive toward the way he/she wants to be treated.
- The government has to set up **Central Mental Health Authority** at national level and **State Mental Health Authority** at state level.
- The Act outlines the process of admission, treatment and discharge of patients.
- **No ECT** therapy without use of muscle relaxants.
- **No ECT** therapy for minors.
- **Financial Punishment:** Up to 6 months of imprisonment or ₹10,000 or both for violating of provisions of MHA 2017. Repeat offenders may face up to 2 years imprisonment or fine of ₹50,000 – 5,00,000 or both.
- **Reception order:** Refers to an order for admission and detention of a mentally ill person in a psychiatric hospital.



### KEY POINTS

- The term 'Psychiatry' was coined by **Christian Reil**.
- **Linda Richards** is considered **First Psychiatric Nurse**.
- **Sigmund Freud** is the father of **Modern Psychiatry**.
- **Freud's model of development** which comprises 'id, ego and superego' is called **Structural Model**.
- **World Mental Health Day** is observed on **10th October**.
- The **Indian Lunacy Act** was passed in the year **1912**.
- The **Indian Mental Health Act** was passed in the year **1987**.
- **Mental Health Act 2017** decriminalizes suicide attempt by mentally ill person.

## DEVELOPMENT OF PERSONALITY

### Factors Influencing Personality Development

#### Biological Factors

- **Heredity:** Genetic characteristics such as height, color of the skin and appearance influence personality of a person.
- **Endocrine glands:** Secretions of endocrine glands heavily influences one's behavior, e.g. Male hormone, testosterone is associated with aggression.
- **Physique:** An individual's physical characters such as height, weight and general appearances determine the behavior toward others.
- **Nervous system:** Nervous systems work in close coordination with endocrine system. The behavior of an individual is managed and controlled by the nervous system.

#### Environmental/Social Factors

- **Family:** Most important factor in molding personality among environmental factors is family.

- **School:** Schools play a significant role in building personality of a growing child.
- **Teacher:** Desirable personalities of a teacher are often inculcated in student's behavior. Undesirable and prejudicial treatment by teachers often negatively affects student's personality.
- **Peer group:** Peer group plays a vital role in shaping the personalities of the children.
- **Sibling relationship:** The number of siblings, their gender and the age gap influence the children's personality traits, like sharing, cooperativeness, jealousy and aggressiveness.
- **Mass media:** Nowadays, mass media has a major impact on children's behavior as the access and time to these media has increased recently. Use of smart phones and technologies impact the personality of the children as face to face interaction has become less significant at very young age.
- **Culture:** Every culture has its own value system, moral system, beliefs, and norms which shape the behavior of the children. What is considered to be an acceptable behavior in one culture may not be the same in an another culture of the country.



### Practice Questions

1. **Personality of an individual is developed as a result of**
  - a. Genetic inheritance
  - b. Environmental factors
  - c. Both a & b
  - d. None of the above

**Ans. (c) Both a & b**

2. **Which of the following factors can have an effect on development of an individual's personality?**
  - a. General appearance
  - b. Peer group influence
  - c. Cultural beliefs
  - d. All of the above

**Ans. (d) All of the above**

## THEORIES OF PERSONALITY DEVELOPMENT

### Freud's Stages of Psychosexual Development

**Table 1:** Stages of psychosexual development

Stages of development	Main characteristics	Examples of unsuccessful task completion
Oral (Birth to 18 months)	Focus of libido is on Mouth, Tongue and Lips. Pleasure centers on mouth – sucking, biting, chewing	Smoking, overeating, obesity, alcoholism, nail biting, drug addiction, difficulty in trusting others
Anal (18 months to 3 years)	Pleasure focuses on bowel and bladder. Elimination and toilet training are central focus.	Perfectionism or messiness, obsessive compulsive disorder.
Phallic (3–6 years)	Awareness of genital area as source of pleasure. Child learns sexual identity. Conflicts end as child represses urge and identifies with same sex parent. The development of Electra complex ( <i>female</i> ) and Oedipus complex ( <i>male</i> ) occurs during this stage of development. Freud described this as the child's unconscious desire to eliminate the parent of the same sex and to possess the parent of the opposite sex.	Sexual dysfunction (transexuality, homosexuality, sexual identity problem) difficulty in accepting authority
Latency (6–12 Years)	Quite stage in sexual development. Child learns to socialize.	Inability to conceptualize; lack of motivation in school or job.
Genital (12 years to adulthood)	The genitals are again the focus of stimulation. Sexual maturity and satisfactory relationships with opposite sex is the central focus	Unsatisfactory relationship, impotence, premature ejaculation.





## Golden Points to Remember

- The Nobel Prize for experiments on split brain was given to Roger Sperry.
- The theory of operant conditioning was experimented by B F Skinner.
- Mental Healthcare Act 2017 (MHA 2017) received presidential assent on April 7th, 2017 and replaced the 1987 Act.
- Mental Health Act 2017 decriminalizes suicide attempt by mentally ill person.
- As per MHA 2017, No ECT therapy without use of muscle relaxants and No ECT therapy for Minors.
- Mental Health Act (MHA 2017) empowers a mentally ill person to have the right to make an advance directive toward the way he/she wants to be treated.
- Reception order refers to an order for admission and detention of a mentally ill person in a psychiatric hospital.
- Temporary discharge of the patient from the psychiatric hospital is referred to as Parole.
- Trust is the most important factor in a therapeutic relationship.
- Termination of interpersonal relationship starts in orientation phase.
- Transference is a phenomenon in which the person in treatment redirects feelings for others onto the therapist.
- Countertransference occurs when a therapist transfers emotion to a person in therapy.
- ICD stands for International Classification of Diseases.
- The National Mental Health Program (NMHP, 1982) was launched in 1982 by the Government of India.
- National Mental Health Program (NMHP) was re-strategized in 2003 to include two schemes, viz. Modernization of State Mental Hospitals and Up-gradation of Psychiatric Wings of Medical Colleges/General Hospitals.
- Parkinson's disease is caused by a loss of nerve cells in the part of the brain called the substantia nigra (low dopamine levels).
- Part of the brain that is responsible for emotional aspects of behavior is limbic system.
- The part of the brain that regulates cognitive function is cerebrum.
- Mini mental status examination is used to assess cognitive impairment.
- Total score of Mini Mental Status Examination (MMSE) is 30. A score of 24 or more indicates a normal cognition.
- Mini Mental Status Examination (MMSE) score of 19 to 23 indicates mild cognitive impairment; scores of 10 to 18 indicate moderate cognitive impairment. Scores below 10 indicate severe cognitive impairment.
- The most significant characteristics experienced by a patient with depression is depressed mood and loss of pleasure or interest.
- 'Omega sign' is seen in depressed patient.
- Depressed mood and loss of pleasure or interest are the most significant characteristics experienced by a patient with depression.
- Common risk factor in patient with severe depression is suicidal tendency.
- For a patient with severe depression, the setting where there are simple daily routines will be least stressful.
- Aphonia is the inability to produce voiced sound.
- Apathy is a state of indifference, or the suppression of emotions such as concern, excitement, motivation, and passion.
- Kleptomania means irresistible desire to steal things.
- Tardive dyskinesia is the adverse effect resulting from the chronic use of antipsychotics.
- The term schizophrenia is coined by Eugene Bleuler.
- Meaning of term 'Schizophrenia' is split mind.
- Negative symptoms of Schizophrenia include Affective flattening, Alogia, Avolition, and Apathy.
- First rank symptoms of schizophrenia (FRSS) was described by Schneider.
- Four A<sub>s</sub> of Schizophrenia (According to Eugen Bleuler) are: Associative looseness, ambivalence, autistic thinking, and affective changes.
- Waxy flexibility, mutism, bizarre posture and stupor are characteristics of catatonic schizophrenia.
- Persecutory delusion and/or suspiciousness is common in paranoid schizophrenia.
- Late adolescence to early adulthood is the most common period of onset of schizophrenia.
- Flight of ideas is typical feature of mania.
- Type of diet is recommended for a patient with manic episode is finger foods.
- Most appropriate intervention to manage manipulative behavior of a manic patient is to set limits on patient behavior.
- Calling hospital security should be the first step by the nurse following a violent episode on a psychiatric unit.
- False sensory perceptions with no basis in reality (no external stimuli) is known as hallucination.
- Illusion is a distortion of senses characterized by misinterpretation of stimuli.
- Formed visual hallucinations are usually from lesion of temporal region.
- Unformed hallucinations are common with disorders of the occipital lobe.
- Auditory hallucination is the most common type of hallucination experienced by patients with mental illness.
- Mood congruent hallucination refers to hallucination whose content represents or reflects the mood state of the individual.

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**“He who has health has hope; and he who has hope has everything.”**

—Arabian proverb



# CLINICAL CASE-BASED QUESTIONS

1

A 32-year-old woman complains of intense depressed mood for last 6 to 8 months. She also reports inability to enjoy previously pleasurable activities. The nurse recognizes this symptom as:

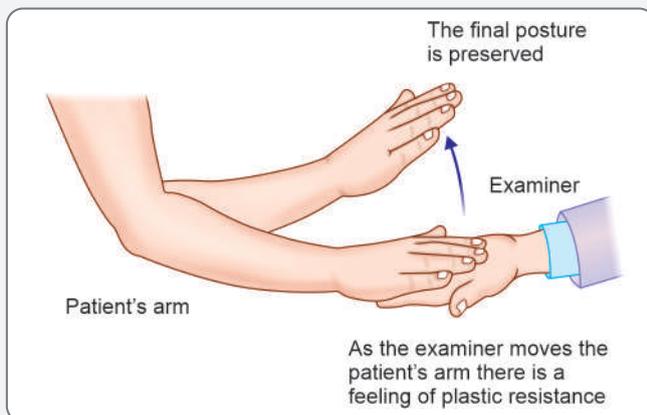
- a. Avolition
- b. Ambivalence
- c. Anhedonia
- d. Apathy

**Ans. (c) Anhedonia**

**Explanation:** Anhedonia is the inability to experience pleasure or lack of interest in previously enjoyable activities. Avolition is the inability to initiate or persist in goal-directed activities. Ambivalence is the state of having mixed feelings about something. Apathy is a lack of interest or concern in the world around oneself.

2

A patient was standing still near his bed and the examiner tried to move his hand as given in the picture below. The catatonic feature demonstrated is:



- a. Negativism
- b. Posturing
- c. Waxy Flexibility
- d. Echopraxia

**Ans. (c) Waxy Flexibility**

**Explanation:** Waxy flexibility is a condition in which a person's limbs can be moved into and held in any position, even a bizarre or uncomfortable one, without any resistance. The main difference between waxy flexibility and posturing is that waxy flexibility refers to the maintenance of a rigid or fixed posture when someone else moves or positions the individual's body, as if it were made of wax. On the other hand, posturing involves assuming unusual or rigid body positions voluntarily, often adopting bizarre or unnatural postures for an extended period of time without external manipulation.

3

A patient says she loves her child and wants to hug him but also hates him and wants to hurt him. She is unable to decide what to express. This is known as:

- a. Abulia
- b. Ambivalence
- c. Anhedonia
- d. Apathy

**Ans. (b) Ambivalence**

**Explanation:** Ambivalence refers to having conflicting feelings or emotions toward someone or something. In the given case, the patient expresses both love and hate toward her child, indicating conflicting emotions. She wants to hug him but also wants to hurt him, demonstrating ambivalence.

4

Mr. X is diagnosed with major depression and is admitted into an acute care psychiatric ward. He has recently attempted to commit suicide. While having a conversation with the nurse, he says to the nurse, "I wish I were dead! I've always been a failure. Things never go well for me." Which of the following statement by the nurse suggests that she has used appropriate therapeutic communication technique?

- a. "You have many reasons to continue to live for"
- b. "What makes you to feel that you are a failure"
- c. "Experiencing these emotions are a part of being depressed"
- d. "You've been feeling like a failure for a while"

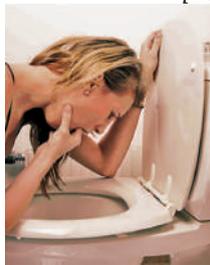
**Ans. (d) "You've been feeling like a failure for a while"**

**Explanation:** The therapeutic technique used in this statement is reflection or paraphrasing. The nurse restates or reflects the patient's expressed feelings of being a failure by saying, "You've been feeling like a failure for a while" This technique demonstrates active listening and understanding, allowing the nurse to confirm and acknowledge the patient's emotions.

The other options are not therapeutic communication techniques. Option (a), "You have many reasons to continue to live for" is a form of positive reinforcement, which is not appropriate for a patient who is feeling suicidal. Option (b), "What makes you to feel that you are a failure?", is a form of probing, which can be counterproductive in a therapeutic setting. Option (c), "Experiencing these emotions are a part of being depressed," is a form of labeling, which can be invalidating for the patient.

# ? Image-Based Questions

1. Identify the behavioral syndrome as shown in photograph: [Recent Question 2013]



- a. Anorexia nervosa      b. Bulimia nervosa  
c. Obesity                      d. Binge-eating disorder

5. Method of substance use shown in figure is mainly used for:



- a. Ganja                              b. Bhang  
c. Charas                              d. Cocaine

2. Fear of situation shown in the photograph is known as:



- a. Xenophobia                      b. Sitophobia  
c. Algophobia                      d. Ichthyophobia

6. Plant shown in photograph is NOT a source of:



- a. Bhang                              b. Charas  
c. Cocaine                              d. Ganja

3. Disorder in which a person develops sexual arousal with object shown in photograph:



- a. Sexual masochism              b. Voyeurism  
c. Frotteurism                      d. Fetishism

7. Plant shown in the photograph can lead to ..... poisoning: [Recent Question 2017]



- a. Cocaine                              b. Opioid  
c. Cannabis                              d. None of these

4. Identify paraphilia shown in photograph:



- a. Sadism                              b. Exhibitionism  
c. Sexual masochism              d. Frotteurism

8. Maximum score of test shown in photograph is:



- a. 13                                      b. 30  
c. 47                                      d. 55



Ans.

1. b  
2. b  
3. d  
4. d  
5. d  
6. c  
7. b  
8. b

"To keep the body in good health is a duty... otherwise we shall not be able to keep our mind strong and clear."

—Buddha



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### DEFINITION AND HISTORY OF PSYCHIATRIC NURSING

1. A psychiatric illness may be manifested by all of the following; EXCEPT:

- Impairment in pre-existing functioning
- Impoverishment of feelings
- Disturbance in behavior
- Unpopular beliefs

**Explanation:** Unpopular beliefs or opinion by an individual is not considered as psychiatric illness. Fixed false belief that is not changed by rational explanation is known as delusion.

2. Which of the following is not a medicopsychiatric condition? (AIIMS BPL NO 2018)

- Insulinoma
- Agitated depression
- Hyperthyroidism
- Angina

**Explanation:**

- Agitated depression is a psychiatric condition without organic involvement (medical condition). Agitated depression is also known as "melancholia agitation." It is known as "mixed mania" or "mixed features." Other conditions are medico-psychiatric condition.
- Strategy:** Use the rule of elimination to solve this question. Find out three medical condition which are associated with psychiatric condition (medicopsychiatric condition) and eliminate them. Among given options, the medical conditions that are associated with psychiatric conditions are Insulinoma, Hyperthyroidism and Angina.

3. The state of complete disorganization and confusion which leads to loss of identity and direction. It is known as: (Safdarjung NO 2018)

- Equilibrium
- Bargaining
- Chaos or disruption
- Resistance

**Explanation:**

- The state of complete disorganization and confusion which leads to loss of identity and direction is chaos and disruption. When a person is not able to cope up with the existing problems and become disorganized externally or internally is called Chaos and disruption. It hugely affects the harmony and performance of the person.
- Equilibrium is a state of balance. Bargaining is a process of negotiation. Resistance is an action or inaction towards the change.

4. Assuming the all members of a group are alike is called: (AIIMS BBS NO 2018)

- Cultural imposition
- Cultural competency
- Clustering
- Stereotyping

**Explanation:** A stereotype is a belief that all members of a certain group act and think in the same fashion.

5. Who is the first psychiatric nurse?

(AIIMS Raipur Staff Nurse Grade I-2018)

- Hildegard Peplau
- Linda Richards
- Sigmund Freud
- Jean Watson

**Explanation:** Linda Richards is considered as the first psychiatric nurse.

6. Who is the father of modern psychiatry?

- Benjamin Rush
- Philippe Pinel
- Emil Kraepelin
- William Tuke

**Explanation:** Philippe Pinel is considered as the father of modern psychiatry and Benjamin Rush is considered as the father of American psychiatry.

7. Which of the following is one of the general principles of mental health nursing?

- Judgment of patient symptoms
- Use self-understanding as a therapeutic tool
- Repeated talking
- Focus on symptoms of patients

8. Which of the following statement about mental illness is true?

- Marriage can cure mental illness
- Mental illness is connected to committing sin in the past
- Mental illness is curable
- Mentally ill patients are dangerous for the society

9. Term 'Psychiatry' was coined by:

- Skinner
- Sigmund Freud
- Christian Reil
- Eugene Bleuler

10. Nobel Prize for experiments on Split brain was given to:

- M. Morgia
- Penfield
- M. Gazzaniga
- Roger Sperry

11. Name the author who propounded psychoanalysis:

- Sigmund Freud
- Carl Jung
- Jean Piaget
- Wilhelm Wundt

12. Father of Intelligence test is: (DSSSB PHN, 2015)

- Alfred Binet
- Erick Erickson
- Alfred Adler
- Carl Jung

Ans.

- d
- b
- c
- d
- b
- b
- b
- c
- c
- d
- a
- a

**Explanation:**

- **Alfred Binet (early 1900s)** is known as the man who created the first intelligence test in the form as we know them today. He is commonly known as the father of IQ testing.

Theorists	Theory
Alfred Binet	Father of intelligence test
Erikson's	Psychosocial development
Alfred Adler	School of individual psychology.
Carl Jung	Theory of the Collective Unconscious, Meyers-Briggs personality tests

- 13. Psychoanalytic therapy was developed by:** (RRB SSNE 2015)
- a. Sigmund Freud                      b. Jacobson  
c. Franklin                                d. Aristotle
- 14. Cognitive model of depression was given by:**
- a. Beck                                      b. Skinner  
c. Cerletti                                 d. Freud

**THEORIES OF PERSONALITY DEVELOPMENT**

- 15. In Erickson's theory, adolescent develops a sense of \_\_\_\_\_** (ESIC 2019)
- a. Initiative                                b. Intellect  
c. Identity                                 d. Industry

**Explanation:** In Erickson's theory, adolescent develops a sense of identity, preschooler child develops sense of initiative, and school age child develops sense of industry. Intellect is a distractor that is not associated with Erickson's stages of development. [Refer to Erickson's stage of personality development in Synopsis (Page no. 562)]

- 16. Freud's model of development which comprises 'id, ego and superego' is called:**
- a. Genetic model  
b. Unconscious model  
c. Constructive model  
d. Structural model

**Explanation: Structural model:** Freud developed the psychoanalytic theory of personality development, which argued that personality is formed through conflicts among three fundamental structures of the human mind: the id, ego, and superego.

- 17. According to Kubler-Ross theory of grief, which among the following behavior is observed in stage II?** (AIIMS Bhopal Grade-I 2018)
- a. Depression                              b. Anger  
c. Bargaining                                d. Denial

**Explanation:** The 5 stages of grief according to Kubler-Ross are as follows:

1. **Denial:** E.g. "This can't be happening to me"
2. **Anger:** E.g. "Why is this happening to me?" "Who is to blame for this?"
3. **Bargaining:** Stage of false hope. E.g. "Make the loss less significant"
4. **Depression:** E.g. "I am too sad to do anything"
5. **Acceptance:** E.g. "I am able to exist and adjust what happened to me"

- 18. The techniques of psychoanalysis include the following EXCEPT:** (AIIMS Raipur Grade II 2017)
- a. Exploration  
b. Free association  
c. Clay association  
d. Transference

**Explanation:** Transference is psychological phenomenon in which an individual redirects emotions and feelings, often unconsciously, from one person to another. Free association refers to process of discovering thoughts, memories and feelings by freely sharing all the seemingly random thoughts that pass through the mind. Exploration refers to action of exploring an unfamiliar area through examination of a subject.

- 19. Which of the following behavior by a 35-year-old male client indicates cognitive development?**
- a. Acquire object permanence  
b. Generates new levels of awareness  
c. Intelligence is demonstrated through logical and systematic manipulation  
d. Egocentric thought diminishes

**Explanation:** An adult of age 31 to 45 years generates new level of awareness. As per Piaget's theory of cognitive development object permanence is developed during infancy. Intelligence is demonstrated through logical and systematic manipulation and egocentric thought diminishes are seen among elementary and early adolescence period.

- 20. The part of mind that distinguishes right from wrong and acts as censor of behavior is known:** (RPSC Nursing Tutor 2009)
- a. Id    b. Ego  
c. Superego                                    d. Libido

**Explanation:** The id, ego, and superego are names for the three parts of the human personality which are part of Sigmund Freud's psychoanalytic personality theory. The superego is the ethical component of the personality and provides the moral standards by which the ego operates. The superego develops last, and is based on morals and judgments about right and wrong.

- 21. Identity v/s role confusion is the task of which stage of development according to Erik Erikson:**
- a. Toddler  
b. Preschool  
c. Adolescent  
d. Adult

**Explanation:**

Age	Psychosocial Crisis
Infancy (0–2 years)	Trust Vs Mistrust
Early childhood (2–4 years)	Autonomy Vs Shame doubt
Preschool (4–5 years)	Initiative Vs Guilt
School age (5–12 years)	Industry Vs Inferiority
Adolescence (13–19 years)	Identity Vs role confusion
Early adulthood (20–39 years)	Intimacy Vs Isolation
Adulthood (40–64 years)	Generativity Vs Stagnation
Maturity (65–Death)	Ego integrity Vs despair



**Ans.**

13. a  
14. a  
15. c  
16. d  
17. b  
18. c  
19. b  
20. c  
21. c

“One day in perfect health is much.”

—Arabic

CHAPTER

# 6



## PEDIATRIC NURSING

### SYNOPSIS

#### GROWTH AND DEVELOPMENT

##### Growth

Growth denotes the net increase in size or mass of tissue. It is a quantitative measurement.

##### Development

Development specifies the maturation of function. It is a qualitative measurement.

##### Stages of Growth and Development

###### Prenatal Period

Ovum	0–14 days after conception
Embryo	14 days to 8 weeks
Fetus	8 weeks to birth (8–40 weeks)

###### Postnatal Period

Neonate/newborn	0–28 days
Infancy	29 days – 1 year
Toddler	1–3 years
Pre-school child	3–6 years
School going child	6–10 years (girls) 6–12 years (boys)
Adolescent	puberty–adulthood
Early adolescent	12–14 years
Middle adolescent	14–16 years
Late adolescent	16–20 years

##### Factors Affecting Growth and Development

- Age
- Race
- Genetic factors
- Antenatal factors
- Natal factors
- Nutritional factors
- Hormonal factors
- Sex
- Biorhythm
- Seasonal variation

- Environmental factors (Infections, illness, trauma to growing parts of bones)
- Social factors (Socioeconomic class, cultural habits, education of parents, education of child, psychological factors and psychosocial factors)

##### Principles of Growth and Development

- Growth and development in children is a continuous orderly process.
- Growth pattern of every individual is unique.
- Different body tissues grow at different rates.
- Development is a continuous process.
- Development depends upon the maturation of nervous system.
- The sequence of attainment of milestone is same in all children.
- The process of development progresses in cephalocaudal direction and proximodistal direction.
- Certain primitive reflexes have to be lost before attainment of relevant milestone.
- The initial disorganized mass activity is gradually replaced by specific and willful actions.
- Development depends on maturation and learning.

##### Weight

The average weight of a neonate is 3 kg. In Indian children, 2.5–3.5 kg weight of a neonate is considered as normal.

In the first few days after birth, newborn loses extracellular fluid equivalent to 10% of the body weight. So, there will be slight decline in the birth weight of the baby. The usual pattern of gaining weight is shown in the table.



#### KEY POINTS

- Growth and development in children are the continuous orderly processes.
- The sequence of attainment of milestone is same in all children.
- The process of development progresses in cephalocaudal direction and proximodistal direction.
- The baby attains three times of its birth weight by one year of age.
- The baby attains four times of its birth weight by two years and 5 times by three years of age.



#### Recent Question (NORCET 2023)

1. A baby at 3 year will be considered as for having developmental delay if he or she
  - a. Cannot hop on one foot
  - b. Cannot catch ball reliably
  - c. Cannot hold spoon effectively
  - d. Cannot copy a square

Ans. (c) Cannot hold ...

**Table 1:** Average weight chart for children

Age of the baby*	Weight of the baby*
Birth	X
5–6 months	2x
1 year	3x
2 years	4x
3 years	5x
5 years	6x
7 years	7x
10 years	10x

(\*approximate values are given in the table)

'x' denotes birth weight of the baby.

Weight between ages of 3 months and 12 years can be calculated by using Weech's formula;

$$3-12 \text{ months: Expected weight (kg)} = \frac{\text{Age in months} + 9}{2}$$

$$1-6 \text{ years: Expected weight} = (\text{Age in years} \times 2) + 8$$

$$7-12 \text{ years: Expected weight (kg)} = \frac{(\text{Age in years} \times 7) - 5}{2}$$

An easy formula to calculate weight in children between 2 and 12 years is

$$\text{Weight (kg)} = \text{Age} \frac{(\text{Age in years} + 3) \times 5}{2}$$

## Length/Height



**Figure 1:** Stadiometer



**Figure 2:** Infantometer

**Table 2:** Length/Height of children

Age of the baby*	Length/height of the baby*
Birth	50 cm
3 months	60 cm
6 months	65 cm
9 months	70 cm

Contd...

## Recent Questions (CNCI 2021)

2. A baby whose birth weight is 3 kg, what will be his required weight at the age of 4 years?

- 6 kg
- 12 kg
- 14 kg
- 16 kg

**Ans. (d) 16 kg**

3. The expected height of a normal child at 12 months is:

- 45 cm
- 50 cm
- 75 cm
- 100 cm

**Ans. (c) 75 cm**

## Recent Question (NORCET 2023)

4. Up to which age height of the child is measured in lying down posture?

- 12 months
- 18 months
- 24 months
- 36 months

**Ans. (c) 24 months**

## KEY POINTS

- Head circumference is a measurement of a child's head around its largest area.
- Head circumference is measured over the most prominent part on the back of the head (occiput) and just above the eyebrows (supraorbital ridges).
- Microcephaly is defined as a head circumference 2 standard deviations (SDs) below the mean for age and sex or roughly less than the 3rd percentile.

## (NORCET 2021)

Length of baby doubles by 4 years of age



Age of the baby*	Length/height of the baby*
1 year	75 cm
2 years	90 cm
4 years	100 cm

(\*approximate values are given in the table)

After 4 years, a child gains approximately 6 cm height every year until 12 years of age.

- >5 years age—height measured in standing position using stadiometer.
- 5 years or below—height measured in lying position using infantometer.

### Head Circumference (HC)

**Table 3:** Head circumference for various ages

Age	Head circumference (cm)
At birth	34–35
2 months	38
3 months	40
4 months	41
6 months	42–43
1 years	45–46
2 years	47–48

- Head circumference is measured by placing tape over occipital protuberance at the back and just over the supraorbital ridge and glabella in front.
- Increased head circumference: Hydrocephalous, Macrocephaly
- Decreased head circumference: Microcephaly

### Chest Circumference (CC)

- The CC is about 3 cm less than the HC at the time of birth (31 cm approx.)
- HC and CC become almost equal by 1 year of age and after that CC exceeds the HC.
- CC is measured at the level of nipples in mid inspiration.

### Mid Upper Arm Circumference (MUAC)

At birth, average MUAC is about 9–11 cm in normal newborn baby

- At 1 year it is 12–16 cm
- At 1–5 year it is 16–17 cm
- At 12 years it is 17–18 cm
- At 15 years it is 20–21 cm

### Arm Span (Wing Span)

- Arm span is the distance between the tips of the middle finger of both arms when they are outstretched at right angles to the body. The arm span is 1–2 cm less than the height of children below 5 years and by 10–12 years both will be equal.
- Arm span is greater than height in:
  - Marfan syndrome, Klinefelter syndrome, Homocystinuria



- Arm span is less than height in:
  - Achondroplasia, cretinism

### Skin Fold Thickness (SFT)

- Instrument used for measurement is Lange's or Harpenden's skin-fold callipers.
  - It holds a fold of skin over triceps area on the left side
  - Measure the area between thumb and index finger
  - Triceps skin fold are most popular
  - Ratio of total body water and body weight is a more accurate index of body fat.

### Eruption of Teeth

#### Primary Teeth

The primary dentition consists of 20 teeth. There are four incisors (two central and two lateral), two canines and four molars in each jaw.

**Table 4:** Teeth eruption according to the age (till 33 months)

Age	Eruption
Birth	Nil
8–12 months	Central incisors
9–13 months	Lateral incisors
13–19 months	First molar
16–22 months	Canines
25–33 months	Second molars

#### Permanent Teeth

**Table 5:** Teeth eruption according to the age (up to 22 years)

Age (Years)	Eruption
6 years	First molars
7–8 years	Central and lateral incisors
9 years	First premolar
10–11 years	Second premolar
11–12 years	Canines
12–13 years	Second molars
17–22 years	Third molars (wisdom teeth)



### KEY POINTS

- The Chest Circumference (31 cm approx) is about 3 cm less than the Head Circumference at the time of birth.
- Head Circumference (HC) and Chest Circumference (CC) are almost equal by 1 year of age and after that CC exceeds the HC.
- The arm span is 1–2 cm less than height of children below 5 years and by 10–12 years both will be equal. Then arm span exceeds the height.
- In children, arm span is greater than height in Marfan's syndrome, Klinefelter's syndrome and Homocystinuria.
- Arm span is less than height in Achondroplasia, cretinism.
- Instrument used for measurement of skin fold thickness is Lange's or Harpenden's skin fold callipers.
- The first two teeth to erupt are the two bottom central incisors.

### Recent Question (NORCET 2023)



5. Identify an example of age-independent anthropometry?

- MUAC
- Weight
- Head circumference
- Chest circumference

Ans. (a) MUAC



## Golden Points to Remember

- New Ballard Scale is frequently used scale for assessment of the gestational age. It assesses six external physical and six neuromuscular characteristics.
- Loving, consistent care, including playing by parents help in infant's cognitive and psychosocial development.
- Negativism is commonly seen in young children (Toddlers). It is a behavior characterized by the tendency to resist direction from others, and refusal to comply with requests.
- The normal newborn hemoglobin level is 17-20 g/dL.
- Drug of choice for neonatal seizure: Phenobarbitone.
- Vitamin deficiency responsible for neonatal seizure: Pyridoxine (Vitamin B<sub>6</sub>).
- Descending motor paralysis is seen in:
  - Botulinum
  - Polio
  - Diphtheria
- If a newborn's head and trunk are allowed to fall backward it elicits moro reflex.
- Neonatal reflex elicited by touching the cheeks of the baby is rooting reflex.
- Most common cause of meningitis in the age group of 3 months-3 years: H. influenza.
- The most common form of childhood brain tumor is Medulloblastoma.
- Phototherapy is indicated for children with hyperbilirubinemia.
- Artificially acquired immunity is obtained by immunization with antibody response. Antibodies are administered, not produced by the body.
- Breastfeeding is natural passive immunity which is obtained by immunoglobins in mother's breast milk.
- BCG vaccine is given Intradermally. In intradermal injection, needle is placed almost flat against patient's skin (15°).
- Tetralogy of Fallot (TOF) is a combination of four heart defects present at the time of birth. It includes Ventricular Septal Defect (VSD), Pulmonary Valve Stenosis (PVS), overriding of aorta, Right Ventricular Hypertrophy (RVH).
- A complication of erythroblastosis fetalis is kernicterus, which is caused by deposition of bilirubin in the brain. Exchange transfusion is needed to prevent the complication.
- Drug used to keep Patent Ductus Arteriosus (PDA) open is **PGE1 (Misoprostol)**.
- Drug used to treat PDA is Indomethacin.
- Bulging sack-like lesion filled with spinal fluid and spinal cord element is known as myelomeningocele.
- Reye's syndrome is associated with the use of aspirin with viral illness. Reye's syndrome most often affects children. It causes swelling in the liver and brain.
- The ratio of lung inflation to chest compression in cardiopulmonary resuscitation is 1:3.
- Both Indomethacin and Ibuprofen are equally effective in closing Patent Ductus Arteriosus.
- Commonly occurring accident among newborn babies is falling from bed.
- **Myoclonic seizure is the most common type of seizure occurring in newborn.**
- Baby-Friendly Hospital Initiative (BFHI) was launched by WHO in the year of 1991.
- Most abundant immunoglobulin of human body is IgG.
- Only class of immunoglobulin which is transported across the placenta is IgG.
- Vaccine of Diphtheria, Tetanus Toxoids and Pertussis (DTP) is contraindicated in **progressive neurological illness**.
- Method used for the transportation of vaccine from the site of production to the vaccination site is Cold Chain.
- Bacillus Calmette–Guérin (BCG) vaccine is administered through intradermal route.
- Measles, Mumps, and Rubella (MMR) are live vaccines and route of administration is subcutaneous.
- Varicella vaccine provides protection against chicken pox.
- Subacute sclerosing panencephalitis may occur years after measles vaccination as a complication.
- Diaper rashes most commonly caused by *Staphylococcus aureus*.
- Site of lesion in polio is **ventral horn of spinal cord**.
- Parenteral polio vaccine is also known as Salk.
- Oral Polio Vaccine is also known as Sabin.
- Burns are the most common documented cause of accidents in toddlers followed by choking, toxic ingestions and drowning.
- Child's participation in decision-making process about health care is termed as Assent.
- Normal adult hemoglobin contains two alpha chains and two beta chains.
- Neonatal anemia is defined as hemoglobin less than 13 g/dL.
- Anemia in children is defined as hemoglobin less than 11 g/dL.
- Treatment of choice for thalassemia major is **blood transfusion and desferrioxamine**.
- Hemophilia affects only male.
- A female who inherits one affected X chromosome becomes a 'carrier' of hemophilia.
- Vitamin 'A' deficiency leads to diarrhea and hyperkeratosis in children.
- Cleft palate is usually repaired around 12 months of age.
- Cleft lip is usually repaired at four to six months of age.
- Congenital absence of ganglion cells in the submucosal and myenteric plexus of the distal intestine is known as **Hirschsprung's disease**.
- Projective vomiting is a feature of **hypertrophic pyloric stenosis**.
- Drug of choice to treat scabies in younger children is 5% permethrin cream.
- Frequent swallowing is a sign of hemorrhage in child who underwent tonsillectomy.
- Drug of choice in trachoma for children is oral tetracycline.
- Tetracycline is contraindicated in infants and young children.
- To administer eardrop in children below age 3, pull the pinna downward and backward. In adult the pinna will be held upward and backward.
- Toddler and preschooler are more prone to accidental poisoning due to their curiosity and desire to explore the world.
- Damage caused by lead poisoning is irreversible in CNS, but in all other body system the damage is reversible.

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Golden Points



Contd...

**“He who has health has hope; and he who has hope has everything.”**

**—Arabian proverb**



# CLINICAL CASE-BASED QUESTIONS

1

**What is the possible diagnosis for a one-year-old baby brought by the mother with a cystic mass on the lumbosacral area and the inability to move both legs since birth?**

- a. Pilonidal cyst
- b. Meningocele
- c. Meningomyelocele
- d. Sacrococcygeal teratoma

**Ans. (c) Meningomyelocele**

**Explanation:** Meningomyelocele is a type of neural tube defect where the spinal cord and its protective covering, the meninges, protrude through an opening in the spine. It usually presents as a cystic mass on the back, commonly in the lumbosacral area. This condition can cause paralysis or weakness in the lower limbs, as well as other neurological complications.

**Pilonidal cyst:** Cyst or abscess in the cleft of the buttocks near the tailbone. Unrelated to the presented symptoms.

**Meningocele:** Protrusion of the meninges through a defect in the skull. Unrelated to the cystic mass on the back.

**Sacrococcygeal teratoma:** Tumor at the base of the tailbone. Not present at lumbosacral area.

2

**A mother of a newborn calls the health and wellness clinic to express her concern about the umbilical cord care, as she noticed the cord was wet and had some discharge when she was cleaning it. What would be the most suitable instruction for the nurse to give to the mother?**

- a. Bring the infant to the health and wellness clinic for further assessment
- b. Continue monitoring as this is a normal occurrence and no further action is needed
- c. Increase the number of times that the cord is cleaned per day
- d. Monitor the cord for another 24–48 hours and call the clinic if the discharge continues

**Ans. (a) Bring the infant to the health and wellness clinic for further assessment**

**Explanation:** If the mother notices any signs such as the umbilical cord being wet, discharging, oozing, or redness around its base, it may be sign of infection. The mother should be advised to visit the clinic for further evaluation and appropriate treatment.

3

**In the emergency department, a mother presents with her 5-year-old child who fell off a bunk bed, and a head injury is suspected. The nurse evaluates the child's airway and monitors for both early and late indicators of increased intracranial pressure (ICP). Which of the following is a late sign of increased ICP?**

- a. Nausea
- b. Irritability
- c. Headache
- d. Bradycardia

**Ans. (d) Bradycardia**

**Explanation:** Increased intracranial pressure refers to a condition where there is an abnormal increase in pressure within the skull. As ICP rises, it can cause compression and compromise of brain tissue, leading to various signs and symptoms. The options provided include both early and late signs of increased ICP. Early signs of increased ICP include headache, nausea, vomiting, and irritability. Late signs of increased ICP include bradycardia, hypertension, and abnormal breathing patterns.

4

**A 5-year-old child is brought to the emergency department after a fall from a bicycle. Nurse in the emergency department is assessing for signs of increased intracranial pressure, resulting in head trauma. Which of the following signs or symptoms would be cause for concern?**

- a. Bulging anterior fontanel
- b. Repeated vomiting
- c. Signs of sleepiness at 10 p.m.
- d. Inability to read short words from a distance of 18 inches

**Ans. (b) Repeated vomiting**

**Explanation:** Early signs of increased ICP include headache, nausea, vomiting, and irritability. Late signs of increased ICP include bradycardia, hypertension, and abnormal breathing patterns. So, repeated vomiting (option b) is the correct answer. The fontanel of a 4-year-old child would be closed already, so option a is wrong. Other options are nonspecific to increased ICP.

5

An 8-year-old baby presents with fever, cough and confluent rash on hairlines, face, neck and body. The most likely causative agent is:

- a. Rubella
- b. Varicella
- c. Rubeola
- d. Variola

Ans. (c) Rubeola

**Explanation:** Rubeola, also known as measles, commonly presents with symptoms such as fever, cough, and a rash that starts on the face and spreads downward to the rest of the body.

Rubella (German measles) typically causes a milder rash and is less likely to present with a cough. Varicella (chickenpox) causes a characteristic vesicular rash, and variola refers to smallpox, which is an eradicated disease.

6

During the discharge process of a 12-year-old child with hemophilia, the nurse advises the parents regarding the most appropriate sport activity for the child. What sport activity does the nurse recommend?

- a. Swimming
- b. Football
- c. Field hockey
- d. Basketball

Ans. (a) Swimming

**Explanation:** When providing instructions to the parents of a 12-year-old child with hemophilia regarding sport activities, the nurse should consider the safety and potential risks associated with the child's condition. Hemophilia is a bleeding disorder characterized by a deficiency or dysfunction of clotting factors in the blood. Therefore, high-impact or contact sports should generally be avoided to minimize the risk of bleeding and injury. With that in mind, the nurse should recommend low-impact and noncontact sports. So among the given options most appropriate sport activity for the child is swimming.

7

A 1-month-old infant with hydrocele visits the clinic for a follow-up appointment. The scrotum has reduced in size since birth, but fluid is still visible upon illumination. What recommendation is the physician likely to provide?

- a. Advise massaging the groin area few times a day until the fluid is absorbed
- b. Referral to a surgeon for repair
- c. No treatment is necessary; the fluid is reabsorbing normally
- d. Advise to keep the infant in a flat, supine position to promote absorption of fluid.

Ans. (c) No treatment is necessary; the fluid is reabsorbing normally

**Explanation:** A hydrocele is a collection of fluid in the scrotum. In infants, hydroceles often resolve spontaneously without any intervention. It is normal for the fluid to gradually reabsorb over time. Therefore, in this case, since the scrotum has become smaller, the physician is likely to reassure the parents that no treatment is necessary at this time and it will resolve with time.

8

In a 5-year-old child with microcytic, hypochromic anemia, iron therapy was initiated. Despite the child's adherence to the treatment, there was no improvement in hemoglobin levels. On examination, the following finding is noted. What could be the probable etiology?



- a. Liver dysfunction
- b. Celiac disease
- c. Plumbism
- d. Vitamin C deficiency

Ans. (c) Plumbism

**Explanation:** The thin black-blue visible along the margins of gum is known as Burton's line. It is found in patients with significantly higher blood levels of lead. This is caused by the reaction between lead and sulfur ions released by oral bacteria, which deposits lead sulfide at the junction of the teeth and gums.

Lead poisoning is also known as **Plumbism**. The anemia of **lead intoxication** is hypochromic and normo- or microcytic with associated reticulocytosis.

9

A mother brings her male infant to the clinic because she has observed that the infant holds his head in an abnormal position and consistently faces one side. Which of the following is a most likely cause?

- a. Torticollis, characterized by shortening of the sternocleidomastoid muscle
- b. Craniosynostosis, involving premature closure of the cranial sutures
- c. Plagiocephaly, resulting in flattening of one side of the head
- d. Hydrocephalus, leading to increased head size

Ans. (a) Torticollis, with shortening of the sternocleidomastoid muscle

**Explanation:** Torticollis is a condition characterized by the shortening or tightness of the sternocleidomastoid muscle, which runs along the side of the neck. This muscle helps to control the movement and position of the head. When the sternocleidomastoid muscle is shortened or tight on one side, it can cause the infant to hold their head tilted to one side and have difficulty turning it in the opposite direction.



# ? Image-Based Questions

1. Identify the type of conjoined twins



- a. Ischiopagus twins      b. Pygopagus twins  
c. Eluidi twins          d. Craniopagus twins

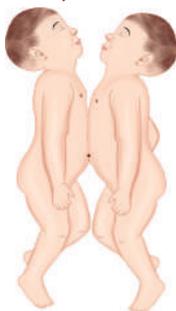
5. Identify the instrument shown in the image

(Refer explanation at the end)



- a. Logan bow              b. Allen bow  
c. Root elevator         d. Periosteal elevator

2. Identify the type of conjoined twins



- a. Pygopagus              b. Thoracophagus  
c. Omphalopagus        d. Parapagus

6. The devise/kit used in this procedure is known as

(Refer explanation at the end)



- a. Metered dose inhaler  
b. Rotahaler  
c. Metered dose inhaler with spacer  
d. Rotahaler with spacer

3. A child diagnosed with VSD (ventricular septal defect) presents with the findings as show in the image. There is no history of fever. Based on this information, what is the most probable cause of these findings?

(Refer explanation at the end)



- a. Infective endocarditis      b. Eissenmenger syndrome  
c. Patent Ductus Arteriosus    d. Mitral valve prolapse

7. Identify the device used for the treatment in the neonate show in the picture?

(Refer explanation at the end)



- a. Thermal blanket              b. Bili blanket  
c. Neonate cooler                d. None of these

4. A pregnant mother experienced a fever and rash during the antenatal period. After delivery, the newborn is found to have Patent Ductus Arteriosus (PDA) and deafness. Further examination with an ophthalmoscope revealed the following findings. what is the most likely cause of these clinical manifestations?

(Refer explanation at the end)



- a. Congenital toxoplasmosis    b. Congenital rubella  
c. Congenital syphilis          d. Congenital Tuberculosis

8. Identify the device shown in the image below

(Refer explanation at the end)



- a. Radiant warmer              b. Giraffe incubator  
c. Portable incubator          d. Shaker incubator

Ans.

1. b
2. c
3. b
4. b
5. a
6. c
7. b
8. b

**“A good laugh and a long sleep are the best cures in the doctor’s book.”**  
—Irish Proverb



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION TO GROWTH & DEVELOPMENT

#### 1. The modern concept of pediatrics means:

(Safdarjung NO 2018)

- a. Short term care of the child
- b. Basic care of the child
- c. Continuous and preventive care of whole child
- d. Terminally ill care of the child

**Explanation:** Pediatrics is defined as the branch of medical science that deals with child development and care during illnesses. As the major causes leading to under five mortality and morbidity are preventable in nature, the modern concept of pediatrics focuses on prevention of illness and promotion of health rather than treatment of illnesses alone.

#### 2. Which part of the brain controls and integrates activities of the autonomic nervous system?

- a. Hypothalamus
- b. Epithalamus
- c. Midbrain
- d. Thalamus

#### 3. Child can help in household chores, dresses and undresses at?

- a. 2 years
- b. 3 years
- c. 4 years
- d. 5 years

**Explanation:** Key social milestones achieved at five years of age include Dressing and undressing asking questions about meaning of words; engaging in domestic role-playing

#### 4. In development of language, a child can tell stories by the age of:

- a. One year
- b. Two years
- c. Three years
- d. Four years

#### 5. Low recurrence in nocturnal enuresis is seen with which of the following interventions?

- a. Desmopressin
- b. Oxybutynin
- c. Imipramine
- d. Bed alarms

**Explanation:** Best success rate is seen with bed alarms which when goes off, child should get up and go to the toilet. Participation of parents is critical in success of this intervention. However, initial management is behavior modification like limiting fluid intake in evening hours and awakening the child during night to go to bathroom. Parents should avoid shaming of the child.

#### 6. Early strict toileting can result in which of the following condition?

- a. Night terror
- b. Temper tantrums
- c. Encopresis
- d. Nocturnal enuresis

**Explanation:** Night terrors refers to disconcerting, screaming or crying that a toddler or young child may have at night during sleep. When a child is toilet-training, he may feel torn between pleasing his parents and being unable to resist soiling. He wants to assert his independence, but he also has a fear of a lack of control. This anxiety and stress can contribute to a child experiencing night terrors.

#### 7. Which of the following milestone is a red flag sign in child development if not attained?

- a. Walking at 12 months
- b. Talking single word at 12 months
- c. Social smile at 3 months
- d. Vocalization at 2 months

#### 8. Which of the following is the most common cause of short stature in child?

- a. Hypothyroidism
- b. Constitutional developmental delay
- c. Growth hormone deficiency
- d. Psychosocial disturbances

**Explanation:** Short stature is said to be present if the height of the child is below the 3<sup>rd</sup> percentile or less than 2 SD of mean height of the corresponding age. Constitutional developmental delay is a significant cause of short stature in mid childhood period. Short stature can be proportional or disproportional.

#### 9. Aspergers syndrome is a:

- a. Metabolic disorder
- b. Neuromuscular disorder
- c. Degenerative disorder
- d. Developmental delay

#### 10. Taste perception of a baby develops at:

- a. Birth
- b. 3 months
- c. 6 months
- d. 8 months

**Explanation:** Newborns are born with odor and taste preferences acquired in the womb from the smell and taste of amniotic fluid which is influenced by what mother eats. At birth, infants can show expressions of pleasure or disgust when presented with pleasant odors such as honey/milk or unpleasant odors and taste.

#### 11. What does it mean when a baby has 25<sup>th</sup> percentile of head circumference (HC)?

- a. 25% of children will have HC more than that
- b. The child is having 25% of normal HC
- c. 25% of children will have HC less than that
- d. 75% of the children will have HC less than that

**Explanation:** Percentile is a number where a certain percentage of scores fall below that number. If a child has 25th percentile HC means that there are 25% of children who has HC less than that.



**Ans.**

- 1. c
- 2. a
- 3. d
- 4. d
- 5. d
- 6. a
- 7. c
- 8. b
- 9. d
- 10. a
- 11. c

**GROWTH CHART**

12. During the first year after birth an infant's birth weight normally:

- a. Quadruples                      b. Doubles  
c. Remain stable                    d. Triples

13. Expected weight of one-year-old child, when the birth weight is 3.5 kg: (RAK MSc 2018)

- a. 7 kg                                      b. 6 kg  
c. 9.5 kg                                  d. 10.5 kg

**Explanation:** As the child ages the weight increase is as follows:

- X      Weight at Birth
- 2x     5 months
- 3x     1 year
- 4x     2 years
- 5x     3 years
- 6x     5 years
- 7x     7 years
- 10x    10 years

So, Birth weight triples (3x) at one year.

Therefore, the correct answer is  $3.5 \times 3 = 10.5$  in a year

14. Which of the following best describes typical annual growth during the school age years?

- a. Few physical differences are noticeable between age mates throughout this period  
b. Fat pads increase in number and add to the normal "chubby" appearance of the child  
c. Child grows an average of 2 inches (5.2 cm) per year  
d. Child gains an average of 3 pounds (1.4 kg) per year

15. Growth chart is used for:

- a. Growth monitoring                b. Diagnostic tool  
c. Tool for action                        d. All of these

16. Growth chart is also known as:

- a. New Ballard scale  
b. Road to health chart  
c. Apgar Score  
d. GCS score

17. Identify the correct statement among the following related to weight of the child:

- a. Normal birth weight of an Indian child is 2.5–3.5 kg  
b. Baby's birth weight doubles at 5-6 months of age  
c. Baby's birth weight triples at 1 year of age  
d. All of the above

18. Normal chest circumference of a newborn is:

- a. 30-32 cm                                b. 35-37 cm  
c. 31-33 cm                                d. 33-35 cm

**New Q**

19. Which of the following is not true regarding the birth weight of a newborn? (AIIMS-BBS SNO 2019)

- a. Birth weight less than 5% of normal on the day of birth requires further investigation  
b. Typical birth weight of newborn is between 2.7 kg and 4.0 kg  
c. Newborns lose 10% of their birth weight by 3-4 days of age  
d. Newborns gain the lost birth weight by 10<sup>th</sup> day of life

**Explanation:** Normal birth weight of the baby is between 2.5 kg and 4.5 kg. Newborns often lose around 10% in the first 4 to 5 days after birth but regain it by about 10 to 12 days of age. So, 5% loss on day of birth is considered normal and requires no further investigation.

20. Identify the incorrect statement related to height/length of a child:

- a. Length of the baby at the time of birth is approximately 45-51 cm  
b. Length of the baby doubles at 4 years of age  
c. Height of a child will increase till the closure of epiphyseal plate  
d. Rate of growth in height is highest during toddler

21. Identify the correct statement related to head circumference/ chest circumference:

- a. At the time of birth, head circumference is about 33-35 cm  
b. At the time of birth chest circumference is about 30-33 cm  
c. In a healthy child, the head and chest circumference will become equal at around 12 months  
d. All of the above

22. In a healthy child, the head and chest circumference equal each other around the age of:

- a. 3-6 months                              b. 6-9 months  
c. 9-12 months                            d. 15-18 months

Ref: OP Ghai 8th ed. p 13

**Explanation:** In a healthy child, the circumference of the chest is about 2-3 cm less than head circumference at birth.

The circumference of head and chest are almost equal by the age of 1 year. Thereafter, the chest circumference exceeds the head circumference.

23. What is the relationship between head circumference (HC) and chest circumference (CC) in a newborn baby?

- a. Both are equal at the time of birth  
b. HC more at the time of birth and both become equal by 1 year and then CC exceeds  
c. CC is more at the time of birth and then both become equal by 1 year and then HC exceeds  
d. None of the above

24. Normal head circumference of a newborn is:

(Staff Nurse G II 2014)

- a. 30-32 cm                                b. 35-37 cm  
c. 31-33 cm                                d. 33-35 cm

25. Normal mid upper arm circumference (MUAC) at birth is about:

- a. 6-8 cm  
b. 9-11 cm  
c. 12-14 cm  
d. 14-16 cm

26. The best method to perform physical examination on a 2-year-old child is:

- a. Proximally to distal  
b. From head to toe  
c. From least to most intrusive  
d. Abdomen to head

27. The nurses assess a six-month-old child during well-baby-clinic. Nurse makes all the following observations. Which of the following assessments made by the nurse is an area of concern indicating a need for further evaluation? (RAK MSc 2018)

- a. Absence of Moro reflex  
b. Closed posterior fontanel  
c. Three pounds weight gain in two months  
d. Moderate head lag when pulled to sitting position

**Ans.**

12. d  
13. d  
14. c  
15. d  
16. b  
17. d  
18. c  
19. a  
20. d  
21. d  
22. c  
23. b  
24. d  
25. b  
26. c  
27. d

“One day in perfect health is much.”

—Arabic

CHAPTER

# 7



## OBSTETRIC AND GYNECOLOGICAL NURSING

### SYNOPSIS

#### ANATOMY OF FEMALE REPRODUCTIVE SYSTEM-OVERVIEW

The female reproductive system refers to the organs and structures involved in the production, transport, and nurturing of the female gamete (egg) and the development and birth of offspring.

It is broadly divided into three categories.

1. External genitalia
2. Internal genitalia
3. Accessory reproductive organs

#### 1. External Genitalia

- It is also known as **vulva** or pudendum.

- It refers to the external structures of the female reproductive system.
- It plays an important role in sexual function.
- It provides a protective barrier for the internal reproductive organs.

#### External Genitalia (Vulva) Includes

- **Mons pubis:** It is the fatty tissue above the pubic bone that is covered with pubic hair. The hair pattern is triangular among most of the women with base directed upward.
- **Labia majora:** Two folds of skin that extend down from the mons pubis and enclose the labia minora and other vulvar structures. It is **homologous to scrotum in male**. It has own sweat gland and apocrine gland.



#### Practice Question

1. While doing pelvic assessment of a pregnant woman nurse noticed red swollen area on the right side of the vaginal orifice. Nurse documented this finding as:
  - a. Hematoma
  - b. Montgomery's tubercles
  - c. Bartholin's gland
  - d. Bulbourethral glands

**Ans. (c) Bartholin's gland**  
**Explanation:** Bartholin's glands are homologous to bulbourethral glands in males. Bartholin's glands are located on either side of the vaginal opening and can become swollen and inflamed due to blockage or infection, leading to the formation of a Bartholin's gland cyst or abscess. Montgomery's tubercles are sebaceous (oil) glands that appear as small bumps around the dark area of the nipple.

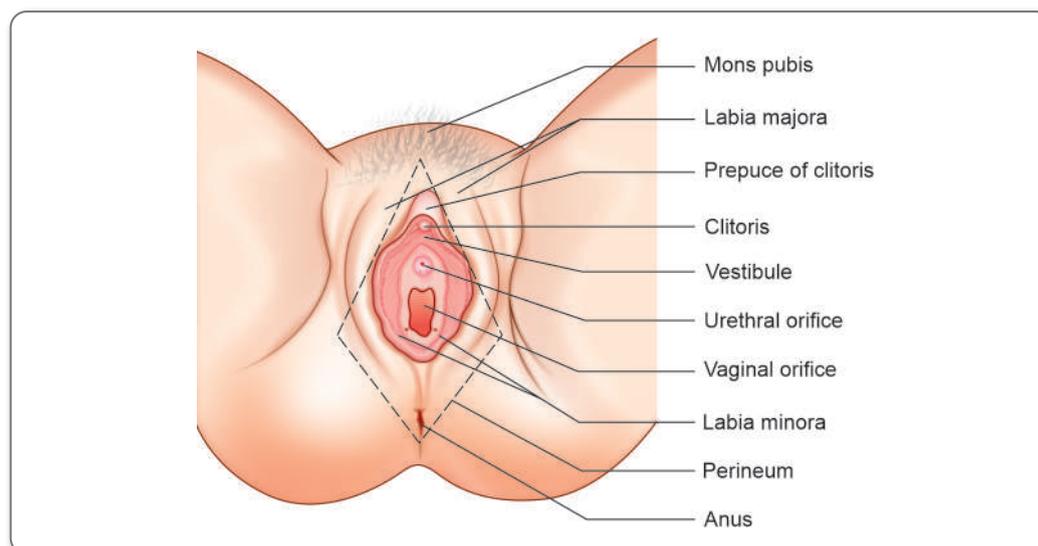


Figure 1: External genitalia

- **Labia minora:** Two thin folds of skin located inside the labia majora that enclose the vestibule. It is **homologous to penile urethra among males**.
- **Vestibule:** The area between the labia minora. It has total six openings. They are: vaginal opening (1), urethral opening (1), Bartholin's duct opening (2) and Skene's gland opening (2).
- **Clitoris:** A small, highly sensitive organ located at the front of the vulva, involved in sexual arousal and orgasm. It is **homologous to penis in the male**.
- **Hymen:** The hymen is a thin membrane that partially covers the vaginal opening in some females. It is typically located about 1–2 centimetres inside the vaginal opening.
- **Urethra:** It is the opening of the bladder and is located between the clitoris and the vaginal opening.
  - **Bartholin's glands:** Two small glands located on either side of the vaginal opening that secrete alkaline mucus to lubricate the vestibule during sexual arousal. It is **homologous to bulbourethral gland** (Cowper gland) among male. A Bartholin's cyst is a fluid-filled sac that forms in one of the Bartholin's glands, which are located on either side of the vaginal opening. These glands secrete fluid that helps lubricate the vagina.

- **Skene's gland:** It is also known as paraurethral glands. It is composed of two smaller glands, located on either side of the urethral opening. The gland produces a fluid that is similar in composition to male prostate fluid. It is also known as female prostate.

## 2. Internal Genitalia

It consists of organs named vagina, uterus, fallopian tube, and ovary.

### Vagina

- The vagina is a muscular tube that connects the cervix (the opening of the uterus) to the outside of the body. The vagina can expand during sexual arousal and childbirth.
- **It measures about 2.5 cm in diameter**, it is widest in upper part and narrowest at introitus.
- From puberty, vaginal pH is acidic (4–5 pH) because of lactic acid produced by Doderlein's bacilli.
- Layers of vagina are mucosa, submucosa, muscular and fibrous layer.

### Uterus

- The uterus is a pear-shaped muscular organ that is responsible for housing and nourishing a developing fetus during pregnancy. It is in the pelvis and is held in place by ligaments.

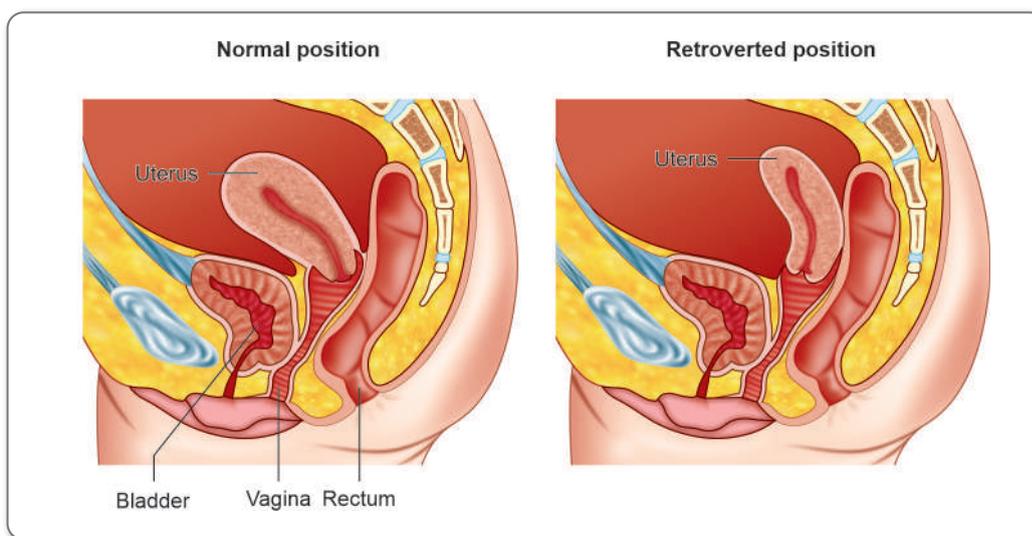


Figure 2: Uterus position

- It is situated between bladder (anterior) and rectum (posterior).
- Normal position of uterus is anteversion and anteflexion and dextrorotation.
- Measurement: It measures 8 cm long, 5 cm across, and 1.35 cm thick and weighs 50–80 g.
- Uterine artery primarily supplies it which is the branch of internal iliac artery.
- **Ligaments supporting uterus (primary support):** Round ligament, uterosacral, transverse cervical, pubocervical.
- Uterus is developed from **Mullerian ducts**.



### KEY POINTS

- External genitalia of a female are also known as vulva or pudendum
- Clitoris in female is homologous to penis in male.
- **Blood supply** to the vulva- pudendal artery
- Nerve supply to vulva - pudendal nerve
- From puberty, vaginal pH is acidic (4–5 pH) because of lactic acid produced by Doderlein's bacilli.



### Practice Question

2. Which female genital structure is homologous to the scrotum in males?
- Mons pubis
  - Labia majora
  - Labia minora
  - Clitoris

Ans. (b) Labia majora



### KEY POINTS

- Uterus is developed from **Mullerian ducts**.
- Primary blood supply to Uterus: Uterine artery
- Uterine artery is the branch of internal iliac artery



- Uterine wall is composed of three layers:
  - Perimetrium:** Outermost serous layer
  - Myometrium:** Middle layer
  - Endometrium:** Innermost mucosal lining of uterine cavity. Thickness changes during menstrual cycle. It changed to decidua during pregnancy.

#### Parts of the uterus

- Fundus
- Body or corpus
- Isthmus
- Cervix

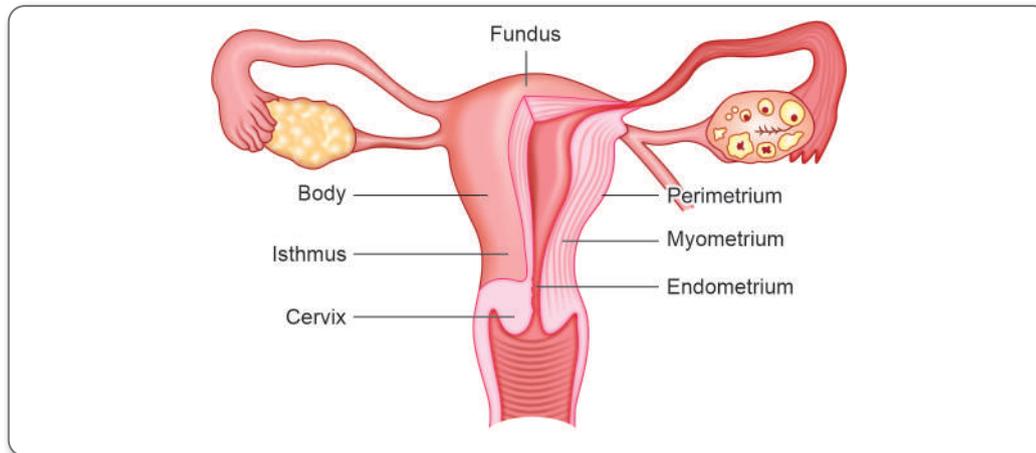


Figure 3: Uterus and its parts

**Fundus:** The fundus is the upper portion of the uterus, which is located above the level of the fallopian tubes.

#### Body

- The body is the central portion of the uterus. It is muscular and can stretch to accommodate a developing fetus.
- The uterine tubes are attached to the upper part of the body.
- The point of fusion between the uterine tube and body is called **cornua of the uterus**.
- **Cornua of uterus** is known as **pacemaker of contraction** as uterine contractions begins from this point during labor.

**Isthmus:** It is the junction between the body and cervix is called isthmus. It is the constricted part.

#### Cervix:

It connects the vagina with the main body of the uterus

The cervix is composed of two regions:

1. The **endocervix** is the proximal and inner part of the cervix. It is **lined by simple columnar epithelium** (mucus secreting).
  2. The **ectocervix portion** of the cervix projects in the vagina. It is lined **stratified squamous non-keratinized epithelium**.
- **Functions:**
    - Facilitates passage of sperm into the uterine cavity.
    - Prevents uterine cavity from bacterial invasion by frequent shedding of the endometrium, thick cervical mucous and a narrow external os.
  - **Blood supply:** Descending branches of the uterine arteries supply cervix and vagina.
  - **Nerve supply:** Sympathetic nerves from the **inferior hypogastric plexus (T10–L1)** supply the uterus and cervix. The **pudendal nerve (S2,3,4)** supplies the vagina and pelvic outlet.

#### Recent Question (NORCET 2022)

1. **Primary prevention for CA Cervix can be done by:**

- HPV vaccine
- Pap smear
- Drug therapy
- Preventing complications

Ans. (a) HPV vaccine



#### KEY POINTS

- Almost all **cervical cancer** cases (99%) are linked to infection with human papillomaviruses (HPV).
- The combination of **HPV vaccination** and cervical screening can prevent most cervical cancer cases.
- The **inferior hypogastric plexus (T10–L1)** supplies the uterus and cervix.

**300+**  
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## Golden Points to Remember

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Wanna Listen & Recall these

Listen & Recall  
**Golden Points**



- There are the **four openings** in the vestibule:
  1. Urethral
  2. Vaginal orifice and hymen
  3. Opening of Bartholin's duct
  4. Skene's gland
- **Fallopian tube is divided into 4 parts** that is interstitial, isthmus, ampulla, and infundibulum.
- The term **parturition** refers to the process of giving birth to a child including both labor and delivery.
- **A parturient** is a woman in labor.
- Full mature ovum is the largest cell in the body and is about **130 microns in diameter**.
- Release of oocyte (ovum) from the ovary following rupture of mature Graafian follicle and available for conception is known as **ovulation**.
- **Fertilization** is the process of fusion of the spermatozoon with the mature ovum.
- Implantation of fertilized ovum occurs through four stages, i.e., **apposition, adhesion, penetration** and **invasion**.
- The decidua is the endometrial layer of the pregnant uterus.
- Daily urine output of fetus at term is **400–1200 mL**.
- **The green color of amniotic fluid** indicates the presence of **meconium**.
- Amniotic fluid appears **golden color** in case of Rh incompatibility.
- Amniotic fluid appears **dark-brown** color in **intrauterine death**.
- **Embryonic period begins** at 3rd weeks up to 8 weeks' post-conception.
- The fetus is **viable** if born after 28 weeks of gestation.
- At term the weight of fetus varies from **2.5 kg to 3.5 kg** (In India).
- **Hematopoiesis** begins first in the yolk sac by 14th day of conception.
- At term 75–80% of the total hemoglobin is of fetal type HbF.
- At term fetal **IgG level is 10% higher** than the mother.
- The maternal **immunoglobulin G (IgG)** crosses the placenta from 12 weeks of pregnancy onward.
- The umbilical vein carries the oxygenated blood from placenta to fetus.
- Functional closure of **foramen ovale occurs soon after birth** but **anatomical closure** takes place in about one year.
- The weight of the uterus at term is **900–1000 g**.
- The weight of the uterus in non-pregnant state is **60 g**.
- **Dextrorotation** is rotation of uterus on its long axis to the right.
- Irregular, spasmodic and painless contraction without dilatation of cervix is known as **Braxton-Hicks contraction**.
- Braxton-Hicks contraction is **not felt in abdominal pregnancy**.
- Secretion can be squeezed out of breast at **12 weeks**.
- **Chloasma gravidarum or melasma** is pigmentation around the cheek, forehead and around the eyes. Chloasma gravidarum is also known as **pregnancy mask**.
- Pigmented area from xiphisternum to symphysis pubis is called **Linea Nigra**.
- Pigmentary changes take place during the pregnancy due to melanocyte stimulation by anterior pituitary.
- A normal healthy woman should gain about 10–12 kg of weight during pregnancy.
- Water retention at term is **6.5 Liters**.
- Due to elevation of the diaphragm (because of the enlarged uterus), the **heart is pushed upward and outward**.
- **Cardiac output** starts to increase at 5th week of pregnancy.
- Total iron requirement during pregnancy is estimated approximately 1000 mg of elemental iron.
- Hormones essential for **follicular maturation** are FHS and small proportion of LH.
- **Human Chorionic Gonadotrophin (hCG)** is secreted by the syncytiotrophoblast cell.
- During pregnancy preparation of breast is called **mammogenesis**.
- Ejection of breast milk is known as **galactokinesis**.
- **Galactopoiesis** refers to maintenance of lactation.
- Thick yellow secretion from the breast occurs at **16 weeks**.
- On examination the height of uterus remains at:
  - The level of symphysis pubis at **12 weeks of pregnancy**.
  - The level of umbilicus at **24 weeks of pregnancy**.
  - Midway between the symphysis pubis and umbilicus at **16th weeks of pregnancy**.
- Reproductive period of a woman begins at **menarche** and ends in **menopause**.
- The normal period of pregnancy is **280 days (40 weeks)**.
- Discoloration and cyanosis of the vulva, vagina, and cervix (Chadwick sign), Goodell's sign, Hegar's sign, uterine enlargement, Braxton Hicks contractions, positive blood pregnancy test are known as **probable signs of pregnancy** (non-specific).
- The positive signs of pregnancy include the detection of a fetal heartbeat, the recognition of fetal movements and visualization of fetus through ultrasound.
- A positive over-the-counter pregnancy test is considered a probable sign of pregnancy.
- Over-the-counter pregnancy tests detect the presence of Human Chorionic Gonadotropin (hCG) hormone.
- Discoloration of the vestibule and anterior wall of vagina is known as **Jacquemier's sign**.
- **Chadwick's sign:** Purplish discoloration of vaginal mucosa visible at 8th week of pregnancy.
- Regular and rhythmic uterine contraction elicited during bimanual examination is known as **palmer's sign**.
- Naegele's formula is used to calculate EDD from LMP. Add 9 calendar months and 7 days to the first day of the last normal period.  $EDD = LMP + 9 \text{ months} + 7 \text{ days}$ .
- The perception of 1st active fetal movement by women is known as Quickening (feeling of life). It occurs about 18–20 weeks in a **primigravida** and as early as 16 weeks in the **multigravida**.



Contd...

“He who has health has hope; and he who has hope has everything.”

—Arabian proverb



# CLINICAL CASE-BASED QUESTIONS

1

The nurse gives Rh<sub>0</sub>(D) injection to a 32-year-old primigravida woman presents with 28th week of pregnancy. Which of the following conditions require administering the injection to the woman?

- a. Rh positive mother and Rh negative father
- b. Rh negative mother and Rh positive father
- c. Both parents are Rh negative
- d. Both parents are Rh positive

Ans. (b) Rh negative mother and Rh positive father

**Explanation:** Rh<sub>0</sub>(D) injection, also known as Rh immunoglobulin or Rhogam, is administered to prevent the development of Rh isoimmunization in Rh negative mothers during pregnancy. Rh isoimmunization can occur when an Rh negative mother carries an Rh-positive fetus.

In this scenario, the woman is a primigravida (first-time pregnant) and in her 28th week of pregnancy. The injection is necessary when the mother is Rh negative, and the father is Rh positive.

2

The nurse educates a mother-to-be about possible danger signs during the last three months of pregnancy. All of the following findings may be the cause of concern; except:

- a. Continuous headache
- b. Blurred vision
- c. Slight rectal bleeding
- d. Marked swelling of hands

Ans. (c) Slight rectal bleeding

**Explanation:** Slight rectal bleeding is not typically considered a danger sign during the last three months of pregnancy. While any bleeding during pregnancy should be reported to a healthcare professional for evaluation slight rectal bleeding is less likely to be directly related to complications specific to pregnancy.

Other given symptoms such as continuous headache, blurred vision and marked swelling of hands can be indicative of conditions such as pre-eclampsia or gestational hypertension, which can be serious and require immediate medical evaluation.

3

The nurse assesses a pregnant woman who has tested positive for gonorrhea. Which of the following medications should be added by the nurse in the treatment plan?

- a. Azithromycin
- b. Tetracycline
- c. Ceftriaxone
- d. Ciprofloxacin

Ans. (c) Ceftriaxone

**Explanation:** Ceftriaxone and spectinomycin are safe and effective for the treatment of gonorrhea in pregnancy. Tetracycline, and ciprofloxacin are not safe to take during pregnancy. Azithromycin monotherapy for gonorrhea is not recommended.

4

A 32-year-old primigravida woman admitted in Obs-Gyn department due to pre-eclampsia. The woman has a history of diabetes mellitus. Which of the following actions should the nurse take first?

- a. Closely monitor the blood pressure of the woman
- b. Prepare the woman for child birth
- c. Ask the health care provider to prescribe calcium supplements
- d. Administer low-dose aspirin as prescribed

Ans. (b) Prepare the woman for child birth

**Explanation:** Pre-eclampsia is a serious condition characterized by high blood pressure and organ dysfunction during pregnancy. It can be life-threatening to both the mother and the baby. The only definitive treatment for pre-eclampsia is the delivery of the baby and the placenta.

Given the woman's diagnosis of pre-eclampsia, the nurse's priority should be to prepare her for childbirth. This may involve notifying the physician, arranging for necessary interventions such as induction of labor or cesarean section, and ensuring that the delivery environment is ready to provide appropriate care.

5

A 28-year G1 presents to your hospital at 8 weeks of gestation. She has a history of diabetes since age 14. She uses insulin and denies any complications related to her diabetes. Which of the following is the most common birth defect associated to diabetes:

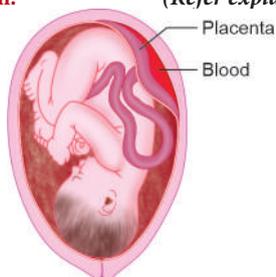
- a. Anencephaly
- b. Meningomyelocele
- c. Sacral agenesis
- d. Ventricular septal defect

Ans. (d) Ventricular septal defect

**Explanation:** Diabetes, particularly poorly controlled diabetes, can increase the risk of various birth defects in infants. Among them, the most commonly associated defect is a ventricular septal defect (VSD). Ventricular septal defect refers to an opening in the septum, the wall that separates the two lower chambers (ventricles) of the heart.

# ? Image-Based Questions

1. Diagnose the underlying disorder shown in the photograph.  
(Refer explanation at the end)



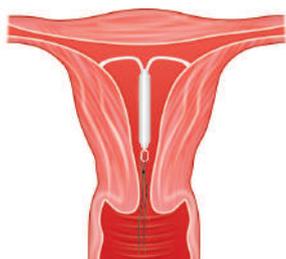
- a. Placenta previa
- b. Placenta abruption
- c. Atonic uterus
- d. Adherent placenta

5. Identify the instrument shown in the image.



- a. Hegar's dilator
- b. Vaginal wall retractor
- c. Sims uterine sound
- d. Sims uterine curette

2. The IUD device used in the image shown below is  
(Refer explanation at the end)



- a. Copper-T 375
- b. Copper-T 380 A
- c. Nova-T
- d. Mirena

6. The instrument given in the picture is used for:



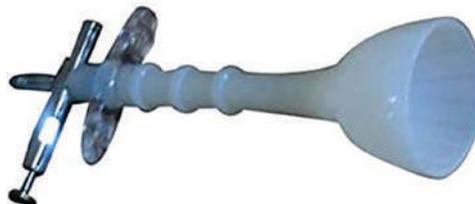
- a. Removing tissue from the lining of the uterus
- b. D & C procedure
- c. Both a & b
- d. None of the above

3. The device/equipment shown in the image is



- a. Manual vacuum aspiration Kit
- b. Malmstorm's vacuum extractor
- c. Suction pump
- d. Silicon vacuum extractor

7. Identify the equipment given in the picture.



- a. Metal cup ventouse
- b. Silicon cup ventouse
- c. Bird's cup
- d. Malmstrom cup

4. Use of the instrument shown in the picture is:



- a. To remove tissue from uterine wall
- b. To dilate vaginal wall
- c. To measure the length and direction of the cervical canal and uterus
- d. None of the above

8. Diagnose the condition shown in photograph.

[Recent Question 2012]



- a. Cracked nipple
- b. Papilloma of nipple
- c. Inverted nipple
- d. Retention cyst of a Gland of Montgomery



Ans.

- 1. b
- 2. d
- 3. a
- 4. c
- 5. d
- 6. c
- 7. b
- 8. c

“He who has health has hope; and he who has hope has everything.”  
—Arabian proverb



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### ANATOMY OF FEMALE REPRODUCTIVE SYSTEM

- Which of the following is not true about female urethra?
  - It is about 4 cm long
  - It is shorter than the male urethra
  - It is posterior to vaginal orifice
  - It is straight and offers minor resistance for catheterization
- Vulva is composed of which of the following structures?

**New Q**

  - Vaginal introitus, labia majora, labia minora and clitoris
  - Clitoris, vestibule and fourchette
  - Labia majora, labia minora and cervix
  - Cervix, uterus and ovary
- All of the following are the part of vulva, except:
  - Bartholin's gland
  - Vaginal opening
  - Mons pubis
  - Ampulla

**Explanation:** The vulva consists of the external female sex organs. The vulva includes the mons pubis, labia majora, labia minora, clitoris, Vestibular bulbs, fourchette, vulval vestibule, urinary meatus, the vaginal opening, and Bartholin's and Skene's vestibular glands. The urinary meatus is also included as it opens into the vulval vestibule.

- Nerve supply to vulva is through:
  - Ilioinguinal nerve
  - Pudendal nerve
  - Genitofemoral nerve
  - All of these
- The structure that provides a pad of fatty tissue for the external female genitalia is:
  - Perineum
  - Labia minora and majora
  - Mons pubis
  - Vulva
- Identify the part of uterus among the following?

*(AIIMS Raipur Staff Nurse Grade I-2018)*

  - Body
  - Isthmus
  - Cervix
  - All of these

**Explanation:** The uterus has four major regions: Fundus, Body, Isthmus and cervix. So all three given options are part of uterus.

- The most common anatomical position of uterus is:
  - Anteverted and anteflexed
  - Retroverted and retroflexed
  - Retroverted and anteflexed
  - Anteverted and retroflexed

**Explanation:** Normal uterus is anteverted and anteflexed. The normal position is an anteverted uterus, which is tipped forward. The uterine position is also sometimes described in relation to the location of the fundus; that is, an anteflexed uterus, which is normal and where the fundus tilts forward.

- The lower uterine segment is formed from the:
  - Cervix
  - Isthmus and cervix
  - Body of the uterus
  - Isthmus
- Structures that support the uterus include:
  - Round ligament
  - Broad ligament
  - Cervicovaginal junction
  - All of these
- The shape of non-pregnant uterus is:
  - Globular
  - Pear shaped (pyriform)
  - Oval
  - Cylindrical
- True support of uterus:
  - Broad ligament
  - Round ligament
  - Cardinal ligament
  - Uterosacral ligament
- Blood supply of the uterus is by:
  - Ovarian artery
  - Uterine artery
  - Both a and b
  - None of these
- The origin of the ovaries is from:
  - Genital ridge
  - Genital tubercle
  - Wolffian duct
  - Mullerian duct
- Ovarian artery is a branch of:
  - Renal artery
  - Internal iliac artery
  - Abdominal part of the aorta
  - External iliac artery
- Arrange the parts of fallopian tube from medial to lateral order:
  - Interstitial
  - Isthmus
  - Ampulla
  - Infundibulum
  - a, b, c, d
  - d, c, b, a
  - a, c, b, d
  - b, d, a, c

**Explanation:** Intramural or interstitial, isthmus, ampulla and infundibulum is the order of arrangement from medial to lateral.

- Identify the incorrect statement regarding Fallopian tube:
  - Serosa, muscular and mucosa are the layers of fallopian tube
  - Columnar ciliated epithelium is predominant in fallopian tube
  - Uterine and ovarian artery supply blood to it
  - The main function is to produce ova

**Explanation:** All other statements are correct regarding fallopian tube, but the production of ova is the responsibility of ovary and transportation of it to uterus is the responsibility of fallopian tube.

- What happens to the corpus luteum after ovulation if pregnancy does not take place?

**New Q**

  - Produces a lot of oxytocin.
  - Degenerates in a short time.
  - Is maintained intact in the presence of progesterone.
  - Becomes active and secretes FSH and LH.



### Ans.

- c
- b
- d
- d
- c
- d
- a
- b
- d
- b
- c
- b
- a
- c
- a
- d
- b



Ans.

18. c  
19. d  
20. c  
21. a  
22. b  
23. b  
24. b  
25. d  
26. a  
27. d  
28. d  
29. d  
30. a  
31. b  
32. d  
33. d  
34. d  
35. b  
36. c  
37. a  
38. d  
39. a  
40. a  
41. b

**Explanation:** The corpus luteum is a temporary endocrine structure that forms in the ovary after the release of an egg (ovulation). It produces progesterone which is essential for maintaining the lining of the uterus (endometrium) in preparation for pregnancy. If pregnancy does not occur, the corpus luteum will degenerate in a short time, and the levels of progesterone will drop. This will trigger menstruation, which is the shedding of the lining of the uterus.

18. **The normal length of the uterine cavity is usually:**  
a. 5.5-6 cm                      b. 6.5-7 cm  
c. 7.5-8 cm                      d. 8.5-9 cm
19. **Largest cell in the human body is:**  
a. Myelin cell                    b. Glial cell  
c. Osteocyte                      d. Ovum
20. **The falling down of an organ from its normal anatomical position is termed:**  
a. Protrusion                      b. Regurgitation  
c. Procidencia                    d. Hernia
21. **A vaginal fistula that opens into the rectum is called:**  
(LNJP HD 2012)  
a. Rectovaginal fistula        b. Enterovaginal fistula  
c. Vesicovaginal fistula       d. Colovaginal fistula
22. **Accumulation of pus in the fallopian tube is known as:**  
a. Salpingitis                      b. Pyosalpinx  
c. Hydrosalpinx                  d. Hydro-ooipinx
23. **The muscle which stretches from the perineum to ischial tuberosity is:**  
a. Bulbous cavernosum        b. Ischiocavernosus  
c. Gluteus minimus              d. Gluteus maximus
24. **Visual examination of the vagina and cervix with an optical magnifying instrument is termed:**  
a. Proctoscope                    b. Colposcope  
c. Salpingoscope                d. Cystoscope
25. **A procedure that allows the physician to examine the lining of the bladder is called:**  
a. Colposcopy                      b. Urethroscopy  
c. Ureteroscopy                  d. Cystoscopy
26. **Inspection of the uterine cavity by endoscopy with access through the cervix is known as:**  
a. Hysteroscopy                  b. Salpingoscopy  
c. Salpingogram                  d. Hysterosalpingography
27. **Ultrasound is the useful diagnostic method to diagnose the:**  
a. Endometrial carcinoma      b. Cancer cervix  
c. Leiomyosarcoma              d. Fibroid uterus
28. **Inflammation of the fallopian tube is:**  
(AIIMS Bhopal Nursing Officer, 2018)  
a. Endometritis                    b. Vaginitis  
c. Cervicitis                        d. Salpingitis

**Explanation:** Salpingitis is inflammation of fallopian tube. Endometritis is the inflammation of endometrial layer of uterus. Cervicitis is the inflammation of cervix and vaginitis is the inflammation of vagina.

29. **At term uterus weight is:**  
a. 200-300 gm                      b. 400-500 gm  
c. 600-700 kg                      d. 900-1000 gm
30. **Pacemaker of uterine contraction is:**  
a. Tubal ostia                      b. SA node  
c. AV node                         d. Purkinje fibers

**Explanation:** Tubal ostia is the pacemaker of uterine contraction. SA node is the pacemaker of heart.

31. **Which among the following is an age-related change that occurs in female reproductive system?**  
a. Sore nipple  
b. Vaginal dryness  
c. Decreased risk of vaginal yeast infections  
d. Increased level of estrogen

## ANATOMY OF BREAST

32. **Breast is composed of:** (NCFL 2019) (AP)  
a. Glandular tissues only  
b. Connective tissues only  
c. Connective and fatty tissues  
d. Glandular and fatty tissues

**Explanation:** Breast is composed of Glandular tissue (special tissue which produces milk) and the collection of fats cells called adipose tissue.

33. **Breast is the modification of which gland?**  
a. Sebaceous gland  
b. Endocrine gland  
c. Bartholin's gland  
d. Sweat gland
34. **The skin of the breast is thickest at:** New Q  
a. Superior aspect  
b. Lateral aspect  
c. Aereola and nipple  
d. Base
35. **Milk production takes place in which part of the breast?**  
a. Lobes                              b. Lobules  
c. Mammary duct                  d. Nipple
36. **Approximately how many lobes are present in each breast?**  
a. 5-10                                b. 10-15  
c. 15-20                              d. 20-25
37. **At what week of gestation, breast tissue begins to develop in a fetus?**  
a. 4 weeks                            b. 8 weeks  
c. 10 weeks                          d. 12 weeks

## MENSTRUAL CYCLE

38. **Labor takes place after.....day of last menstrual period.**  
a. 260                                b. 270 (RRB Feb 2012)  
c. 250                                d. 280
39. **Implantation of fertilized egg ideally occurs during the .....phase of menstrual cycle.**  
a. Secretory phase  
b. Menstrual phase  
c. Proliferative phase  
d. Ovulation phase
40. **The layer of uterus that is sloughed off during menstruation is:**  
a. Endometrium                      b. Myometrium  
c. Perimetrium                      d. Serous layer
41. **The first episode of menstrual bleeding is called:**  
a. Thelarche                         b. Menarche  
c. Menopause                        d. Menorrhea

**1105. Grand multipara is:**

- Pregnant woman with previous history of four or more births
- Pregnant woman with first pregnancy at the age of 30 or above
- Pregnant woman with previous history of 2 abortions
- Woman with pregnancy at the age of 18 years

**1106. Elderly primigravida is defined as:** (RAK MSc 2018)

- Woman having her first pregnancy above the age of 25
- Woman having pregnancy above the age of 30
- Woman having her first pregnancy below the age of 18
- Woman having her first pregnancy above the age of 35

**Explanation:** Women having pregnancy above the age of 35 years are considered elderly primigravida (FIGO classification). Women having their first pregnancy below the age of 18 years are called adolescent mothers.

**CARE OF NEWBORN****1107. A newborn who is above the 90th percentile on the Intrauterine Growth Curve is termed:** (DSSSB PHN, 2015)

- Post-term baby
- Large for gestational age
- Small for gestational age
- Preterm baby

**1108. Mother has given with opioid during labor process, which among the following drugs most commonly ordered by doctor for the newborn baby?**

- Naloxone
- Morphine
- Calcium gluconate
- Adrenaline

**Explanation:** Use of opioid causes respiratory depression in newborn baby. The antidote naloxone will be ordered by the doctor for newborn baby.

**1109. Among the following, which sign indicates that newborn is adapting well with the external environment?**

- Nasal flare
- Chest in drawing
- Retractions
- Respiration rate 40-60 breaths/min

**Explanation:** Respiratory rate of 40-60 breaths/min is normal in newborn and is showing the adaptation with extra uterine environment.

**1110. A neonate has been diagnosed with cephalohematoma. Which is the incorrect statement regarding the diagnosis?**

- Collection of blood between pericranium and flat skull bone
- It is never present at the time of birth
- Swelling is limited by the suture line
- It involves swelling of the tissue over the presenting part of the head

**Explanation:** Option d is the statement related to caput succedaneum. All other statements are correct in relation to cephalohematoma.

**1111. Newborn at risk for developing RDS is:**

- Newborn with period of gestation < 30 week
- Newborn of diabetic mother
- Newborn who passed meconium in the uterus
- All of the above

**Explanation:** In all the above conditions newborn is at risk for developing RDS.

**1112. Neonates born to woman infected with hepatitis B should undergo which treatment:**

- Hepatitis B vaccine at birth and 1 month
- Hepatitis B immune globulin at birth, no hepatitis B vaccine
- Hepatitis B immune globulin within 48 hours of birth and Hepatitis B vaccine at 1 month
- Hepatitis B immune globulin within 12 hours of birth and Hepatitis B vaccine at birth, 1 month, 6 months

**Explanation:** Hepatitis B immune globulin should be given as soon as possible after birth but within 12 hours.

**1113. Which of the following findings in a newborn baby girl is normal?** (LNJP H D 2012)

- Bleeding from umbilicus
- Respiratory rate of 70/minute at rest
- Yellow skin tone at 12 hours of age
- Passage of meconium within the first 24 hours

**1114. Average birth weight of an Indian baby is:**

- 3.5 kg
- 2 kg
- 4 kg
- 3 kg

**1115. Human fetus has a coat of hair called:** (RRB Feb 2012)

- Lanugo
- Vernix
- Striac
- None of these

**1116. The killing of a newborn child by its parents is called:**

- Restitution
- Infanticide
- Neocide
- Infantism

**1117. Newborn baby automatically turns the face towards the stimulus and makes sucking. This reflex is known as:**

- Startle reflex
- Rooting reflex
- Glabellar reflex
- Corneal reflex

**1118. Serious danger associated with LBW baby is:**

- Respiratory distress
- Feeding problem
- Thermoregulation problem
- Hemorrhage

**1119. A diabetic female at 40 weeks of gestation delivered a baby by elective cesarean section. Soon after birth the baby developed respiratory distress. The diagnosis is:**

- Transient tachypnea of the newborn
- Congenital diaphragmatic hernia
- Tracheoesophageal fistula
- Hyaline membrane disease

**Explanation:** Transient tachypnea of the newborn (TTN) is a common respiratory condition that occurs shortly after birth, usually in term or near-term infants. It is characterized by rapid breathing (tachypnea) and signs of respiratory distress.

In the given scenario, the baby's respiratory distress is likely due to transient tachypnea. This condition can occur in infants delivered by cesarean section, especially if there was limited exposure to the normal squeezing of the birth canal, which helps expel fluid from the lungs. The baby may have retained fluid in the lungs, leading to respiratory symptoms.

**Ans.**

1105. a  
1106. d  
1107. b  
1108. a  
1109. d  
1110. d  
1111. d  
1112. d  
1113. d  
1114. d  
1115. a  
1116. b  
1117. b  
1118. a  
1119. a

"If you would live long, open your heart."

—Bulgarian

## CHAPTER

# 8



# APPLIED MICROBIOLOGY

## SYNOPSIS

### HISTORICAL PERSPECTIVES OF MICROBIOLOGY

- **Microbiology:** It is the study of microorganism which is only visible through microscope.
- Aristotle (384-322) and others believed that living organisms could develop from non-living materials.
- Rogen bacon in 13<sup>th</sup> century described that the disease caused by a minute "seed" or "germ".
- **Antony van Leeuwenhoek (1632–1723)**
  - Descriptions of protozoa, basic types of bacteria, yeasts, and algae.
  - The first to see and describe bacteria and their characteristic morphology.
  - Father of bacteriology and protozoology.
  - In 1676, he observed and described microorganisms such as bacteria and protozoa as "animalcules".
- **1798:** Edward Jenner introduces the concepts of vaccination using cowpox material to prevent small pox.
- **Louis Pasteur:**
  - He coined the term "microbiology", aerobic, anaerobic.
  - He disproved the theory of spontaneous germination.
  - He contributed to the development of the first vaccines for the immunization against rabies, anthrax, and chicken cholera.
  - He described the scientific basis for fermentation, winemaking, and the brewing of beer and pasteurization.
  - Pasteur postulated the **germ theory of disease**, which states that microorganisms are the causes of infectious disease.

- **Joseph Lister (1827–1912)**
  - He is the father of antiseptic surgery.
- **Robert Koch**
  - Discovered causative agent for anthrax, tuberculosis, and cholera.
  - His discoveries, in combination with those of Pasteur, established the germ theory of disease
- **Edward Jenner (1749–1823)**
  - First to prevent small pox.
  - He discovered the technique of vaccination.
- **Alexander Fleming**
  - Discovered penicillin in 1929, an antibiotic produced by a fungus that inhibits bacterial growth.
- **Paul Ehrlich:** In 1882 he reported the acid-fastness of tubercle bacillus.

### THE NORMAL BACTERIAL FLORA OF HUMAN BODY

#### Resident Flora

These organisms are relatively fixed and regular type of organism found at a given body site. They perform functions such as synthesis of vitamin K, absorption of nutrient, breakdown of nutrients, etc.

#### Transient Flora

These are non-pathogenic and potentially pathogenic organisms. These microorganisms do not produce disease under normal circumstances. But if normal flora is destroyed and immune system is weak then they may produce disease.

### KEY POINTS

- **Louis Pasteur (1822-1895)** is considered the father of microbiology.
- **Louis Pasteur introduced sterilization** technique and stem sterilizer, autoclave and hot air oven.
- **Louis Pasteur** introduced first live-attenuated vaccine.
- **Robert Koch** is known as the **father of bacteriology**.
- **Robert Koch** introduced **staining technique**.
- **Robert Koch** discovered anthrax bacillus, tubercle bacillus and the cholera vibrios.
- **Joseph Lister** introduced antiseptic surgery.
- **Karl Landsteiner** discovered **ABO blood groups**.
- **Alexander Fleming** discovered the drug **penicillin**.

## FUNGUS

- Fungi constitute a large, diverse group of heterotrophic organisms, most of which found as saprophytes in the soil and on decaying plant material.
- Fungi classified into yeasts, yeast-like, molds and dimorphic fungi.
- Mycoses can be classified into superficial, subcutaneous, systemic, and opportunistic.
- Candidiasis is the most common mycosis involving skin and its appendages, mucosa and internal organs.

## PARASITES

- These are an animal or plant which lives in or upon another organism and derives its nutrient directly from it.
- Parasites are classified as protozoa (unicellular organisms) and helminths (multicellular organisms).
- Parasites exist in three morphological forms trophozoite, precyst and cyst.



### KEY POINTS

- **Definitive host** - sexual replication of parasite occurs.
- **Intermediate host** - asexual replication of parasite occurs



## Golden Points to Remember

- Bacterial cell division occurs by **binary fission**.
- **Hot air oven is a dry heat** sterilization method while **autoclave is moist heat** sterilization method.
- Temperature and time required in **hot air oven is 160°C for one hour or 180°C for 2 minutes** for sterilization.
- Temperature and time required in **autoclave is 121°C for 30 minutes at a pressure of 15 pounds** per square inch.
- **Filtration** is a method adopted to sterilize sera, sugar and antibiotic solutions.
- A **parasite** is a microorganism which lives on a living host and derives nutrition from the host without any benefits to the host. It causes disease in the host.
- **Antigen** is a substance introduction of this into the body evoke immune reaction.
- **Clostridial pathogenicity** is mainly because of the production of **exotoxin**.
- Mycoplasma differ from other bacteria because they lack a rigid cell wall.
- **Mycoplasma** are the **smallest free living** microorganism.
- **HBsAg** is also called Australia antigen.
- **Definitive host** in which **sexual** replication of parasite occurs.
- **Intermediate host** in which **asexual** replication of parasite occurs.
- **Louis Pasteur** proposed the **germ theory** of disease.
- **Robert Koch** proved/confirmed the germ theory of disease.
- **Mycobacterium leprae** was the first bacterium identified causing disease in humans.
- Mycobacterium tuberculosis is also known as **Koch's bacillus**.
- **Antony Van Leeuwenhoek** developed **microscope** first time.
- **Knoll and Ruska** developed **electron microscope**.
- In bacteria, **mesosome** is responsible for **respiration**, cell division and sporulation.
- Capsule of the bacteria helps it to enable adherence to surface, protection against phagocytosis, and prevents desiccation and provides nutrients.
- Bacteria that are unable to synthesize their own food materials are called **Heterotrophs**.
- Mesophilic bacteria grow best between 25°C and 40°C temperature.
- **Differential staining** gives different colors to different bacteria.
- **Hanging Drop Method** is used to observe the **motility of a microbe**.
- **Blood and Bone Marrow Sample** should be incubated at **37°C** during storage prior to processing.
- Bacteria that thrive in high temperature (40°C–70°C) are called **thermophilic**.
- **Non-motile small appendages** on the surface of bacteria which help in transfer of DNA from one cell to another during conjugation are called **sex pili**.
- **Nosocomial infection** is those infections acquired by a person after 48 hours of hospital stay. The infection should neither be present nor in its incubation period when the patient at the time of admission.
- The interval between exposure to infection and the appearance of the first symptoms is called **incubation period**.
- When a patient is already suffering from an infection acquires another infection from another patient or source is called **cross infection**.
- Organisms that live in an intimate non-parasitic relationship with the host are called **commensal**.
- **Bacteremia** is the presence of pathogenic bacteria in the blood.
- A disease transmitted by direct contact is called **contagious infection**.
- **Physician-induced infections** resulting from investigative, therapeutic and other procedure, like surgery is called **iatrogenic infection**.
- **Autoclaving** is the **most reliable** method of sterilization.

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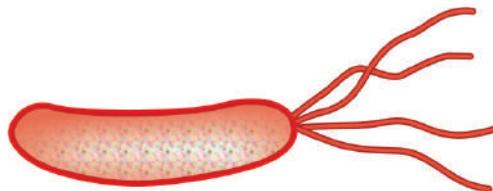
# ? Image-Based Questions

1. Microbiologist shown in photograph is credited with discovery of: [Recent Question 2013]



- a. Sarcoma virus
- b. Mycobacterium tuberculosis
- c. HIV virus
- d. Mycobacterium leprae

5. Identify the type of Flagellar arrangement in Bacterium depicted in photograph.



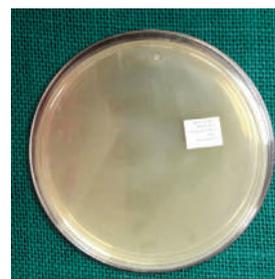
- a. Monotrichous
- b. Peritrichous
- c. Lophotrichous
- d. Amphilophotrichous

2. Identify the instrument shown in the photograph.



- a. Electron microscope
- b. Compound microscope
- c. Dissecting microscope
- d. Confocal microscope

6. Identify the following culture media.



- a. Nutrient agar
- b. Blood agar
- c. Chocolate agar
- d. MacConkey agar

3. Identify the scientist shown in photograph. [Recent Question 2013]



- a. Edward Jenner
- b. Louis Pasteur
- c. James Lind
- d. Antonie van Leeuwenhoek

7. Identify the following culture media.



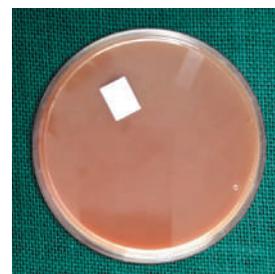
- a. Nutrient agar
- b. Blood agar
- c. Chocolate agar
- d. MacConkey agar

4. Identify the bacterial shape as shown in the photograph.



- a. Bacillus
- b. Vibrio
- c. Spirillum
- d. Spirochaete

8. Identify the following culture media.



- a. Nutrient agar
- b. Blood agar
- c. Chocolate agar
- d. MacConkey agar



Ans.

- 1. b
- 2. c
- 3. d
- 4. b
- 5. c
- 6. a
- 7. b
- 8. c

“A man’s health can be judged by which he takes two at a time - pills or stairs.”

—Joan Welsh



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION & HISTORICAL PERSPECTIVES

1. Which of the following pioneers of Microbiology is credited with the discovery of microorganisms using high quality magnifying lenses (early microscopes)?

(Safdarjung NO 2018)

- a. Antonie van Leeuwenhoek
- b. Louis Pasteur
- c. Robert Hooke
- d. Robert Koch

**Explanation:** Antonie Philips van Leeuwenhoek discovered microorganism. He used a simple single lens device with good magnification. By using magnifying lenses, he discovered microorganisms and also known as Father of Microbiology and therefore, known as the first microbiologist. He discovered protozoa and also improved the microscope.

2. The vaccination was first performed by:

(Banaras HU 2015)

- a. Jonas Salk
- b. Edward Jenner
- c. Louis Pasteur
- d. Alexander Fleming

3. Father of antiseptic surgery is:

- a. Louis Pasteur
- b. Robert Koch
- c. Antonie van Leeuwenhoek
- d. Lister

4. Which among the following is a contribution by Louis Pasteur in the field of microbiology?

- a. Techniques of Pasteurization
- b. Process of Fermentation
- c. Rabies, cholera and anthrax vaccine
- d. All of the above

5. Father of modern microbiology is:

- a. Robert Koch
- b. Edward Jenner
- c. Louis Pasteur
- d. Joseph Lister

**Explanation:** Louis Pasteur is widely regarded as the father of modern microbiology. His contributions to the field include the development of the germ theory of disease, the process of pasteurization, and the discovery of the principles of vaccination. Pasteur’s experiments and discoveries paved the way for advancements in the understanding of microorganisms and their role in causing diseases.

6. Who is known as “Father of Antiseptic Surgery”?

- a. Robert Koch
- b. Joseph Lister
- c. Paul Ehrlich
- d. Antony Van Leeuwenhoek

**Explanation:** Joseph Lister is known as the “Father of Antiseptic Surgery.” He revolutionized surgical practices by introducing antiseptic techniques to prevent infection during surgeries. Lister promoted the use of carbolic acid (phenol) as an antiseptic to sterilize surgical instruments and clean wounds, significantly reducing the risk of infections and improving patient outcomes.

7. Who is known as “Father of Bacteriology”?

- a. Robert Koch
- b. Joseph Lister
- c. Paul Ehrlich
- d. Antony Van Leeuwenhoek

**Explanation:** Robert Koch is known as the “Father of Bacteriology.” He made significant contributions to the field by discovering the causative agents of several diseases, including anthrax, tuberculosis, and cholera.

8. The main difference between Prokaryotic and Eukaryotic cell is absence of:

- a. True nucleus
- b. Genetic material
- c. Plasma membrane
- d. Flagella

9. The discovery that led to the development of first antibiotic was made by:

- a. Robert Koch
- b. Alexander Fleming
- c. Joseph Lister
- d. Antonie van Leeuwenhoek

10. Who accidentally discovered fungus *Penicillium* that produces a substance which destroys staphylococci?

(AIIMS BPL NO 2018)

- a. Alexander Domagk
- b. Eduard Buchner
- c. Karl Popper
- d. Alexander Fleming

11. Penicillin was discovered by:

- a. Robert Koch
- b. Alexander Fleming
- c. Joseph Lister
- d. Antonie van Leeuwenhoek

12. Life cycle of malarial parasite was first described by:

(RPSC NG-II Exam. 2007)

- a. Joseph Lister
- b. Alexander Fleming
- c. Robert Koch
- d. Ronald Ross

13. Germ theory was proposed by:

- a. Pasteur
- b. Koch
- c. Landsteiner
- d. Lister

14. Identify correct statement regarding Robert Koch:

- a. He is known as father of bacteriology
- b. The causative organism of cholera, *Vibrio cholera* was identified by him
- c. He discovered hypersensitivity phenomenon
- d. All of the above



Ans.

- 1. a
- 2. b
- 3. d
- 4. d
- 5. c
- 6. b
- 7. a
- 8. a
- 9. b
- 10. d
- 11. b
- 12. d
- 13. a
- 14. d

**CLASSIFICATION OF BACTERIA**

15. A cluster of polar flagella is called: (Safdarjung NO 2018)

- Lophotrichous
- Amphitrichous
- Monotrichous
- Peritrichous

**Explanation:**

- **Lophotrichous:** The flagella are present in the form of cluster at one pole.
- **Amphitrichous:** When a single or clusters of flagella are present at both ends.
- **Monotrichous:** When a single polar flagellum is present on a bacteria.
- **Peritrichous:** When flagella are lateral and surround whole surface of bacteria.
- **Atrichous:** No flagella

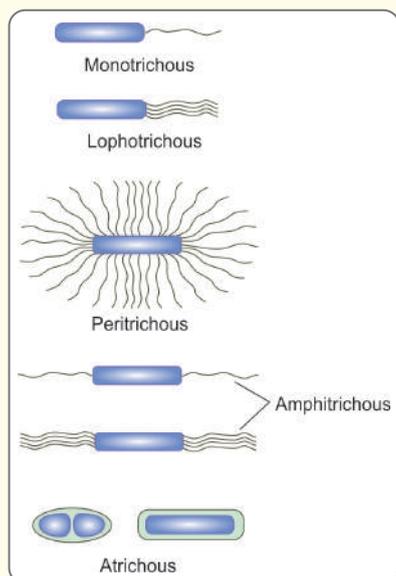


Figure: Types of flagellar arrangement in bacteria

16. Depending upon their oxygen requirement and metabolism

**Vibrio Cholerae species are:** (Safdarjung NO 2018)

- Obligate aerobes
- Facultative anaerobes
- Obligate anaerobes
- Microaerophilic

**Explanation:** *Vibrio cholerae* are aerobes and facultative anaerobes. Facultative anaerobe is organism which forms ATP by aerobic respiration in presence of oxygen, but is capable of switching to fermentation or anaerobic respiration in absence of oxygen.

17. All of the following occur in the stationary phase of bacterial growth curve; EXCEPT: (Safdarjung NO 2018)

- Cells show uniform and regular staining
- Cells show presence of intracellular storage granules
- Spores are seen
- Exotoxins are formed

**Explanation:** In the stationary phase, the bacteria may turn Gram negative from Gram positive. All other statements regarding stationary phase of bacterial growth are true.

18. Which of the following is the unit of measurement in bacteriology? (AIIMS BPL NO 2018)

- Joule
- Newton
- Micron
- Pascal

**Explanation:** 1 micron = one thousandth of a millimeter. It is the unit used in bacteriology.

19. Nutritional dependent bacteria are called:

(AIIMS BPL NO 2018)

- Heterotrophs
- Autotrophs
- Chemotrophs
- Phototrophs

**Explanation:** Heterotrophs do not make their own food so depend on other sources of energy.

Autotrophs make their own food. Chemotrophs use chemicals to prepare their food. Phototrophs use photosynthetic pigments to prepare food.

20. A food item commonly associated with *Bacillus cereus* food poisoning is: (AIIMS-BBS SNO 2019, ESIC 2019)

- Honey
- Green beans
- Baked potato
- Fried rice

**Explanation:** *Bacillus cereus* is a toxin-producing bacteria that is one of the most common causes of food poisoning, also called "fried rice syndrome". The bacteria are contacted from fried rice dishes that have been kept at room temperature for hours.

21. The division of bacterial cells and the exponential increase in their number are indicative of which phase? (AIIMS BPL NO 2018)

- Lag phase
- Stationary phase
- Phase of decline
- Logarithmic phase

**Explanation:** Logarithmic phase, also known as exponential phase is a period described by cell doubling. The number of new bacteria appearing per unit time is proportional to the present population.

22. Example of acid fast bacilli?

(RRB Feb 2012)

- E. coli*
- Mycobacterium*
- Clostridium*
- None of these

23. *Mycobacterium leprae* is also known as:

- Golden bacilli
- Koch's bacillus
- Magical bacilli
- Hansen's bacilli

24. Drug of choice to treat leprosy is:

- Rifampicin
- Acyclovir
- Zidovudine
- Dapsone

25. *Mycobacterium tuberculosis* is also known as:

- Golden bacilli
- Koch's bacillus
- Magical bacilli
- Hansen's bacilli

26. All of the following are acid-fast organisms; EXCEPT:

- Mycobacterium tuberculosis*
- Nocardia*
- Isospora belli*
- Staphylococcus*

27. Bacterial structure involved in respiration is:

- Ribosome
- Pili
- Mesosome
- Flagella



Ans.

- a
- b
- a
- c
- a
- d
- d
- b
- d
- d
- b
- d
- d
- b
- d
- c

**274. Kupffer cells are seen in:**

- a. Thymus                      b. Spleen  
c. Liver                         d. Lymph node

**275. Antibiotic used in Toxic shock syndrome:**

- a. Vancomycin                b. Cephalosporins  
c. Streptomycin              d. Clindamycin

**276. Grave's disease belongs to:**

- a. Type I hypersensitivity  
b. Type II hypersensitivity  
c. Type III hypersensitivity  
d. Type IV hypersensitivity

**277. Type of hypersensitivity involved in Rh incompatibility:**

- a. Type I hypersensitivity    b. Type II hypersensitivity  
c. Type III hypersensitivity   d. Type IV hypersensitivity

**278. Chemically an antigen may be:**

- a. Lipid                         b. Polysaccharide  
c. Protein                      d. Any of these

**279. Example of cell mediated hypersensitivity:**

- a. Transfusion reactions    b. Arthus reactions  
c. Type II lepra reaction    d. Tuberculin test

**280. Tuberculin test is an example of:**

- a. Type I hypersensitivity  
b. Type II hypersensitivity  
c. Type III hypersensitivity  
d. Type IV hypersensitivity

**281. Dose of human tetanus Ig for post exposure prophylaxis:**

- a. 250–500 units  
b. 500–750 units  
c. 750–1000 units  
d. 1000–1200 units

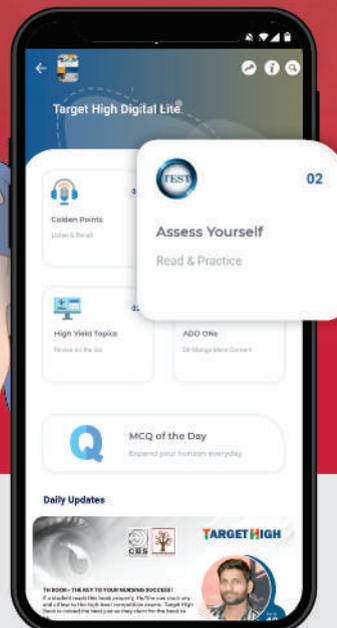
**Ans.**

274. c  
275. d  
276. b  
277. b  
278. d  
279. d  
280. d  
281. a

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“It is health that is real wealth and not pieces of gold and silver.”

—Mahatma Gandhi

CHAPTER

# 9



## APPLIED BIOCHEMISTRY AND NUTRITION

### SYNOPSIS

#### APPLIED BIOCHEMISTRY

##### INTRODUCTION

- Biochemistry is the study of chemical processes within a body and related to the living organisms.
- The first enzyme discovered was ‘diastase’ (now called ‘amylase’) in the year 1833.
- James Watson, Francis Crick, Maurice Wilkins, and Rosalind Franklin (1950s) co-discovered the **helix structure of DNA**.

##### THE CELL

- The cell is the structural and functional unit of life.
- Living cells are divided into two groups:
  - Prokaryotes, e.g., Bacteria (unicellular)
  - Eukaryotic cells, e.g., Animal cells, plant cells, fungi and protozoa (unicellular or multicellular)

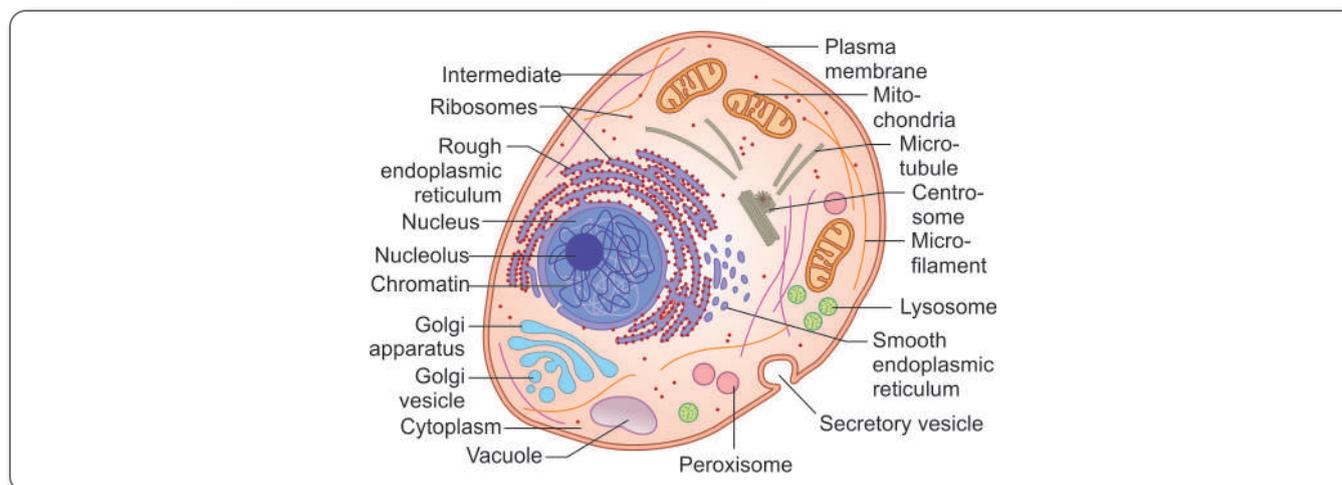


##### KEY POINT

- The name Biochemistry was coined in 1903 by a German chemist named Carl Alexander Neuber (1877-1956). He is regarded as “father of modern biochemistry”.

**Table 1:** Differences between prokaryotic cells and eukaryotic cells

Parameters	Prokaryotic cells	Eukaryotic cells
Cell size	Small (1–10 nm)	Large (1 to 10000 times larger in size than prokaryotic cells)
Overall organization	Simple	Complex
Cell wall	Present	Absent
Cell membrane	Present sometimes surrounded by capsule	Present
Nucleus	Single nucleus which contains double helix DNA that is present in a poorly defined region called nucleoid	Well defined nucleus with a membrane and multiple DNA double helices organized into chromatin
Reproduction	Asexual	Sexual
Examples	Bacteria, blue green algae	Animal and plant cells



**Figure 1:** Animal cell structure

**KEY POINTS****Cell Organelles****Nucleus**

- **Nucleus** is the largest component of the cell, containing DNA organized into separate chromosomes.
- Nucleus is surrounded by nuclear membrane. Nuclear membrane consists of two layers.
- The intermembrane space between inner and outer membrane is known as **perinuclear space (cisterns)**.
- The nucleus is filled with nucleoplasm which contains **nucleolus** and **chromatin**.
- Function of nucleus includes control of cell division (DNA replication), protein synthesis.
- DNA and DNA polymerase are the markers of the nucleus.

**Endoplasmic Reticulum**

- Cisternae have a role in the exchange of materials between the cell and the extracellular fluid.
- **Rough Endoplasmic reticulum (RER)**: Also called granular type of endoplasmic reticulum. It contains ribosomes.
- **Smooth Endoplasmic reticulum (SER)**: Also called agranular type of endoplasmic reticulum. It does not contain ribosomes. SER has enzymes for biosynthesis of lipids and glycoproteins.
- SER is important in hepatocytes for oxidative metabolism and detoxification of many drugs.
- Glucose-6-phosphatase is a marker enzyme for Endoplasmic reticulum.

**Ribosomes**

- Ribosomes on the RER are involved in synthesis of proteins for export from the cell.
- Free ribosomes present in the cytoplasm synthesize proteins for use within the cell.

**Golgi Apparatus (Golgi complex, Golgi body)**

- Golgi apparatus moves molecules from endoplasmic reticulum to their destination.
- It is the site where secretions from other organelles are brought and assembled.
- Newly synthesized proteins are transferred from RER and stored in Golgi apparatus temporarily.

**Mitochondria**

- Mitochondria are the major organelle of a eukaryotic cell.
- Mitochondria contains its own DNA.
- Mitochondrion produces energy in the form of ATP (Adenosine Triphosphate). So it is called as a **“powerhouse of the cell”**.

**Lysosomes**

- It is a membrane-bound cell organelle and are structurally and chemically spherical vesicles.
- Lysosomes are absent in RBC.
- Lysosomes act as **waste disposal system of the cell**.
- They are responsible for cellular homeostasis.
- They are responsible for autolysis, so it is called as Suicide-bags.

**Peroxisomes**

- Major function of peroxisomes is in hepatocytes, involved in oxidation of fatty acids.

**Cytosol**

- It is a colloidal solution of proteins containing nearly 70% water.

**Plasma Membrane (cell membrane)**

- It is the outer membrane of the cell.
- It is composed of lipids, proteins and carbohydrates.
- Functions include compartmentalization, providing cell shape, cell movement, transport of substances and signal transduction.

**TRANSPORT MECHANISMS**

There are three types of transport systems, i.e., Diffusion, Facilitated diffusion and Active transport.

- **Diffusion (simple diffusion or passive diffusion)**: It is a process in which molecules of a material that move from an area of higher concentration to an area of lower concentration. Some solutes like O<sub>2</sub>, N<sub>2</sub>, CO<sub>2</sub>, and NO, urea move across cell membrane by diffusion. The net movement of molecule from one side to the other side of the cell membrane continues until concentration on both sides is at equilibrium.
  - **Channels** are pore-forming membrane proteins which facilitate flow of ions across secretory and epithelial cells.



- **Osmosis**: It refers to the spontaneous net movement of solvent molecules through partially permeable (semipermeable) membrane into a region of higher solute concentration. **Aquaporin** selectively conducts water molecules in and out of the cell.
- **Ionophores**: These are lipid-soluble molecules which facilitate transport of ions across the lipid bilayer of the cell membrane.
- **Facilitated Diffusion**: Transport of solutes through membrane transport proteins (carrier molecules) without expenditure of metabolic energy, e.g., Glucose transporters (GLUT), Cl<sup>-</sup>/HCO<sub>3</sub><sup>-</sup> exchanger, ATP-ADP translocase.

**KEY POINTS**

- A hypotonic solution is any solution that has a lower osmotic pressure than another solution.
- When the cell is placed into a hypotonic solution it rapidly gains water by osmosis and swells.
- When the cell is placed in the hypertonic solution, it loses water by osmosis and shrinks.



## Golden Points to Remember

- The name Biochemistry was coined in 1903 by a German chemist named Carl Alexander Neuber (1877-1956). He is regarded as “father of modern biochemistry”
- The first enzyme discovered was ‘diastase’ (now called ‘amylase’) in the year 1833
- James Watson, Francis Crick, Maurice Wilkins, and Rosalind Franklin (1950s) co-discovered the **helix structure of DNA**
- The cell is the structural and functional unit of life
- **Nucleus** is the largest component of the cell, containing DNA organized into separate chromosome
- Nucleus is surrounded by nuclear membrane. Nuclear membrane consists of two layers
- Function of nucleus includes control of cell division (DNA replication), protein synthesis
- Glucose-6-phosphatase is a marker enzyme for Endoplasmic reticulum
- Mitochondria produces energy in the form of ATP. So it is called as “power house of the cell”
- Ribosomes on the RER are involved in synthesis of proteins for export from the cell
- Lysosomes act as **waste disposal system of the cell**
- Diffusion is a process in which molecules of a material that move from an area of higher concentration to an area of lower concentration
- Osmosis refers to the spontaneous net movement of solvent molecules through partially permeable (semipermeable) membrane into a region of higher solute concentration
- **Aquaporin** selectively conduct water molecules in and out of the cell
- **Ionophores** are a lipid-soluble molecules which facilitate transport of ions across the lipid bilayer of the cell membrane
- Transport of solutes through membrane transport proteins (carrier molecules) without expenditure of metabolic energy is known as facilitated diffusion
- In Active transport, Transport protein moves a specific molecule against the concentration gradient
- A hypotonic solution is any solution that has a lower osmotic pressure than another solution
- When the cell is placed into a hypotonic solution it rapidly gains water by osmosis and swells
- When the cell is placed in the hypertonic solution, it losses water by osmosis and shrinks.
- Dialysis is the process of separating molecules in solution by the differences in their rates of diffusion through a semipermeable membrane
- A pH lesser than 7.35 indicates acidosis
- A pH greater than 7.45 indicates alkalosis.
- Normal pH of blood: 7.35 - 7.45
- Normal range of PaCO<sub>2</sub>: 35 to 45 mmHg
- Normal range of PaO<sub>2</sub>: 75 to 100 mmHg
- Normal range of HCO<sub>3</sub>: 22 to 26 mEq/L
- Normal range of Oxygen saturation (SPO<sub>2</sub>): 95-100%
- Lungs and kidneys stabilize extracellular fluid pH
- Respiratory system **controls pCO<sub>2</sub>** that minimize pH changes in arterial blood
- **Kidney** regulates acid-base balance by controlling **bicarbonate reabsorption** and **secreting acid**.
- **Anion gap is a difference between the sum cations and anions**
- All enzymes are protein in nature and have large molecular weights
- Enzymes secreted in their active form are called **zymase**
- Enzymes secreted in their inactive form is known as **proenzyme** or **zymogen**
- **Increase in temperature** increases the rate of enzyme catalyzed reaction
- **Optimum pH** for most of the enzymes is in the neutral range, i.e. around 7.0
- Optimum pH for pepsin is about 2.0 and pancreatic juice is near 8.0
- Carbohydrates are the most abundant biological molecules containing Carbon (C), Hydrogen (H) and Oxygen (O) molecules
- Energy production from carbohydrates is 4 kcal/g.
- Aldoses has aldehyde (–CHO) group on carbon-1, e.g. Glucose
- **Ketoses** has ketone (–CO) group at carbon-2, e.g. Fructose
- Trioses are the smallest monosaccharide with 3 carbon atoms, e.g. Glyceraldehyde
- **Disaccharides consist of two monosaccharides**
- **Sucrose is a cane sugar made up of Glucose and Fructose**
- Lactose (milk sugar) is a disaccharide made up of D-Glucose and D-Galactose
- Fructose (monosaccharide) is a fruit sugar
- Starch is stored as reservoir of food in cereals and tubers in **plant**
- Carbohydrate forms 50-70% of total energy intake in a balanced diet.
- Net yield of ATP in Glycolysis: Aerobic - 36 ATP, Anaerobic - 2 ATP.
- Total ATP yield in TCA cycle is 12 ATP.
- Gluconeogenesis refers to formation of glucose from non-carbohydrate sources.
- TCA cycle is also called Citric acid cycle or Krebs cycle.
- **Total ATP yield in TCA cycle is 12 ATP** per molecule of acetyl CoA
- Gluconeogenesis is a process of formation of glucose from non-carbohydrate sources such as glucogenic aminoacids, glycerol, lactate etc.
- Gluconeogenesis takes place in fasting state, thus enables maintenance of blood glucose
- Insulin is the only hormone which has hypoglycemic action
- Glucagon promotes glycogenolysis and gluconeogenesis, thus increasing blood glucose concentration
- Glucose Tolerance Test (GTT) is performed to confirm diagnosis of diabetes. In this test, 75 gm of glucose (1g/kg of body weight) is given in 200-300 ml of water
- The lipids are known as esters of fatty acids
- Lipids are insoluble in water.

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**"Ill-health of body or of mind, is defeat. Health alone is victory."**

—Thomas Carlyle



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION AND ANATOMY OF CELL

**1. Pyknosis is characterized by:** (Safdarjung NO 2018)

- a. Nuclear basophilia
- b. Nuclear shrinkage
- c. Nucleus disintegration
- d. Nucleolus disintegration

**Explanation:** Pyknosis is irreversible cell death characterized by nuclear condensation/shrinkage and clumping of chromatin.

**2. The activation of caspases is likely to lead to:**

(Safdarjung NO 2018)

- a. Apoptotic cell death
- b. Blood coagulation
- c. Mitotic cell division
- d. G1 and S phase of cell cycle

**Explanation:** Activation of enzymes called Caspases leads to apoptosis which is a pathway of cell death. Caspases are cysteine proteases that help in cleavage of proteins.

**3. Mitosis is a condition of:** (Banaras HU 2015)

- a. Cell breakdown
- b. Cell division without reduction
- c. Cell death
- d. Cell division with half chromosomes

**4. Powerhouse of the cell is:** (ESIC Chennai May 2012)

- a. Mitochondria
- b. Nucleus
- c. Golgi bodies
- d. Cell wall

**5. Chief components of a cell are:**

- a. Carbon, hydrogen, nitrogen and oxygen
- b. Hydrogen, nitrogen, sodium and potassium
- c. Magnesium, potassium, carbon and hydrogen
- d. Helium, nitrogen, calcium and carbon

**6. The aqueous component of the cell, within which various organelles and particles are suspended, is:**

- a. Cytosol
- b. Cytoplasm
- c. Nucleus
- d. Cytoblast

**7. Number of mitochondria is less in:**

- a. Red fibers
- b. Myosin
- c. White fibers
- d. Actin

**8. Storage house of iron in a cell is:**

- a. WBC
- b. Reticuloendothelial system
- c. Platelet
- d. Ribosome

**9. Cytokines are responsible for:**

- a. Pain
- b. Touch
- c. Sensation
- d. Inflammation

**10. Largest organelle of a cell is:**

- a. Golgi apparatus
- b. Nucleus
- c. Ribosome
- d. Endoplasmic reticulum

**11. Suicidal bag of cell is:**

- a. Ribosome
- b. Lysosomes
- c. Vacuole
- d. Nucleus

**12. Plasma membrane of eukaryotic organisms is made up of:**

- a. Phospholipid bilayer
- b. Phospholipid monolayer
- c. Carbohydrate, protein and fat
- d. Carbon, nitrogen and oxygen

**13. Structure and motility of the cell is maintained by:**

- a. Cartilage
- b. Microtubules
- c. Nucleus
- d. Golgi apparatus

**14. Powerhouse of the all human body is:**

- a. Nucleus
- b. Ribosome
- c. Mitochondria
- d. Lysosome

**15. Produced form of energy is:**

- a. ATP
- b. ADP
- c. GTP
- d. Actin

**16. Cytoplasm refers to:**

- a. Contents of the cell including nucleus
- b. Contents of the cell excluding nucleus
- c. Nucleus of the cell
- d. Nucleus and cytosol of the cell

**17. Protein factory in human cell is:**

- a. Ribosome
- b. Nucleus
- c. Cytoplasm
- d. Golgi apparatus

**18. \_\_\_\_\_ has no nucleus:**

- a. RBCs
- b. WBCs
- c. Lymphocytes
- d. Monocytes

**19. Pinocytosis are:**

- a. Drinking
- b. Phagocytosing
- c. Moving
- d. RNA production

**20. Phagocytosis is the responsibility of:**

- a. Eosinophil
- b. Neutrophils
- c. Monocyte
- d. Lymphocyte

**21. Which of the following order is correct about phases of mitosis cell division?**

- a. Prophase - Anaphase - Telophase - Metaphase
- b. Prophase - Anaphase - Metaphase - Telophase
- c. Prophase - Metaphase - Telophase - Anaphase
- d. Prophase - Metaphase - Anaphase - Telophase

**22. Name the tissue which is widely and abundantly distributed in human body:**

- a. Connective tissue
- b. Cartilaginous tissue
- c. Lymphoid tissue
- d. Epithelial tissue

**23. All are loose connective tissues; EXCEPT:**

- a. Areolar
- b. Reticular
- c. Adipose
- d. Epithelial



**Ans.**

- 1. b
- 2. a
- 3. b
- 4. a
- 5. a
- 6. b
- 7. c
- 8. b
- 9. d
- 10. b
- 11. b
- 12. a
- 13. b
- 14. c
- 15. a
- 16. b
- 17. a
- 18. a
- 19. a
- 20. b
- 21. d
- 22. a
- 23. d

357. All the following are foods rich in iron; EXCEPT: (AIIMS BBS NO 2018)
- a. Spinach                                      b. Fish  
c. Milk    d. Liver

**Explanation:**

- 100 gm of raw spinach contains 2.71 mg of iron
- 100 gm of fish contains 28 mg of iron
- 100 gm of liver contains 17 mg of iron
- 100 gm of milk contains 0.04 mg of iron

358. How many calories are there in one gram of fat? (Safdarjung NO 2018)
- a. 4    b. 12  
c. 8    d. 9

359. BMI greater than 30 is considered as: (DSSSB PHN, 2015)
- a. Overweight  
b. Bulimia  
c. Obese  
d. Stout

360. In which organ does the maximum absorption of Iron take place? (RRB SSNE 2015)
- a. Stomach    b. Small Intestine  
c. Colon    d. Liver

361. How many calories does 1 gm of fat give? (JIPMER 2012)
- a. 4    b. 8  
c. 10    d. 9

362. Prolonged use of Kesari dal can lead to: (JIPMER 2012)
- a. Lathyrism    b. Gastric upset  
c. Gout    d. Esophagitis

363. Which of the following nutrients does not provide energy to body?
- a. Minerals    b. Protein  
c. Carbohydrate    d. Fat

364. The following digestive enzyme is present in gastric juice:

- a. Pepsin  
b. Trypsin  
c. Chymotrypsin  
d. Peptidases

365. Energy required in addition to total calories for a lactating mother from 0-6 months is:

- a. + 350 kcal    b. + 450 kcal  
c. + 550 kcal    d. + 600 kcal

366. Basal metabolic rate is measured in:

- a. Post-absorptive state  
b. Lying down  
c. Awake  
d. All of the above

367. Obesity is usually assessed by:

- a. BMI    b. BMR  
c. Growth chart    d. None of these

368. BMR is affected by:

- a. Body temperature    b. Body size  
c. Gender    d. All of these

369. Food energy is measured in:

- a. Kilocalories    b. Proteins  
c. Grams    d. None of these

370. The storage form of iron is:

- a. Hemeprotein    b. Cytochromes  
c. Ferritin    d. All of these

371. The average water loss in urine is:

- a. 500 mL    b. 1200 mL  
c. 1500 mL    d. 1000 mL

372. For planning a balanced diet, it is essential to have:

- a. Knowledge of the RDAs    b. Physiological status  
c. Food groups    d. All of these

373. Urine will have abnormal color in all the following conditions; EXCEPT:

- a. Melanuria    b. Porphyria  
c. Creatinuria    d. Alkaptonuria

374. Normal urine contains all following; EXCEPT:

- a. Glucose    b. Ethereal sulfate  
c. Bicarbonate    d. Creatinine

**CLASSIFICATION OF FOOD**

375. Highest energy yielding food group is: (Safdarjung NO 2018)

- a. Carbohydrates    b. Fats  
c. Sugars    d. Protein

**Explanation:**

Food group	Calories/gram
Fats	9
Carbohydrates (sugars)	4
Protein	4

376. Select the pair which has the same relationship as the pair Iodine: Goiter. (RRB SSNE 2015)

- a. Mango: Anemia    b. Insulin: Diabetes  
c. Hormones: Cancer    d. Fat: Obesity

377. Which of the following is significantly different between human and cow's milk? (RRB SSNE 2015)

- a. Proteins and Fat    b. Proteins and sugar  
c. Proteins and Lactose    d. Minerals

378. The best way to retain nutrients while cooking vegetables is:

- a. Wash and peel vegetables  
b. Avoid soaking in water  
c. Drain water after cooking  
d. Use shortest cooking time

379. Dietary fiber is rich in:

- a. Collagen    b. Pectin  
c. Starch    d. Proteoglycan

**FOOD PRESERVATION METHODS**

380. The best way of increasing the nutritive value of pulses is: (AIIMS BBS NO 2018)

- a. Mixing pulses  
b. Fortification  
c. Parboiling  
d. Germination

**Explanation:** The sprouting breaks down the macromolecules into low molecular weight molecules, which can be easily digested and absorbed in body. Sprouting increases the bioavailability of iron, zinc and calcium. Sprouting reduces the phenol and tannin content in foods.

**Ans.**

357. c  
358. d  
359. c  
360. b  
361. d  
362. a  
363. a  
364. a  
365. d  
366. d  
367. a  
368. d  
369. a  
370. c  
371. c  
372. d  
373. c  
374. a  
375. b  
376. b  
377. c  
378. a  
379. b  
380. d

“One day in perfect health is much.”

—Arabic

CHAPTER

# 10

## APPLIED SOCIOLOGY AND PSYCHOLOGY



### SYNOPSIS

#### APPLIED SOCIOLOGY

##### INTRODUCTION

- **Sociology:** The study of social life, social change, and the social causes and consequences of human behavior.
- **Anthropology:** The study of what makes us human.
- **Individual:** An individual is a person with unique identity, may be similar to siblings but not exactly same except in case of twins.
- The word “sociology” was coined by **Auguste Comte**, a French Philosopher in 1839.
- **Auguste Comte** is considered the “Father of Sociology”.

##### SOCIALIZATION

- Socialization is a lifelong process which starts at birth and continues till death. At each distinct phase in life, there are transitions to be made or crises to be overcome.

##### Importance of Socialization

- Helps an individual to make transitions and adapt to the changing environment.
- Process of socialization includes the elements and agencies of socialization such as family, formal educational system (school, college), peer group, media and technology, religion, government, legal system, and workplace.
- Socialization starts at birth.
- Socialization is innate and unavoidable.

##### Elements of Socialization

- The **physical** and **psychological heritage** of the individual.
- The **environment** in which he/she is born.

- The **culture** in which an individual’s rearing is done.

##### Features of Socialization

- **Imitation:** It is copying the acts of others.
- **Suggestion:** It is a process of communication in which the suggested idea is accepted without logical grounds.
- **Identification:** In the very early stages, a child cannot make any distinction between himself and his environment. Most of his initial reactions are just natural and spontaneous. As he grows older, he learns to identify through which he satisfies his needs.
- **Language:** Language is the medium of expression.

##### Phases of Socialization

- **Primary socialization:**
  - It takes place in infancy and childhood.
  - This is the most crucial stage of socialization, as the basic behavior pattern is learnt by the child at this stage.
  - The child internalizes many of the socially approved values, attitudes, beliefs, and behavior patterns of his culture.
  - It is further divided as oral stage, anal stage and oedipal stage.
- **Secondary socialization:**
  - It starts from the later stage of childhood and goes up to maturity.
- **Anticipatory socialization:**
  - It is the kind of learning which describes a person’s future roles.
  - Anticipatory socialization makes the individual expect his or her own participation in a social situation by watching how others would behave in that situation.



##### KEY POINTS

- Sociology emerged as an independent and separate discipline around the middle of the 19th century.
- Merton coined the term anticipatory socialization.



##### Practice Questions

1. **Society is a web of social relationships” is said by .....**
  - a. Maciver
  - b. Comte
  - c. Spencer
  - d. Darwin

**Ans. (a) Maciver**

2. **“Man is a social animal” is said by .....**
  - a. Aristotle
  - b. Max Weber
  - c. Mead
  - d. Karl Max

**Ans. (a) Aristotle**

3. **Who among the following defined socialization as “the process of working together, of developing group responsibility, or being guided by the welfare needs of others”?**
  - a. Ogburn
  - b. Lundberg
  - c. Johnson
  - d. Bogardus

**Ans. (d) Bogardus**

- **Developmental socialization:**
  - As an individual grows, he changes and molds himself according to the standards and the needs of the society.
- **Resocialization:**
  - It is a process by which one's sense of social values, beliefs, and norms are re-engineered.
  - Resocialization is a kind of learning, which involves the learning of new ways of thinking. Feeling and behaving that are completely different from one's previous way of life.
  - **For example**, resocialization occurs when one converts into a different religion or joins army or is put in a prison.

### Individualization Versus Socialization

- **Individualization** is the development of oneself through taking decisions by himself and learning to act independently. It is influenced by other

external factors like the family, community, and the environment.

- **Socialization** is the process by which the individual learns to conform to the norms of the group.

### FAMILY

Family is a group of people affiliated either by consanguinity (by birth), affinity (by marriage or other relationships), or by coresidence or combination of these.

### Characteristics of Family

- Mating relationship
- Marriage
- Nomenclature system
- Economic provision
- Common habitation

### Types of Family

Types of family	Advantage	Disadvantage
<b>Nuclear family:</b> This type of family consists of two parents and their children.	<ul style="list-style-type: none"> <li>• Good personality development among children</li> <li>• Good status of female</li> <li>• Effective family planning</li> <li>• Peace and harmony in family environment</li> <li>• More responsibilities on each family members</li> <li>• Less chance for family conflict</li> </ul>	<ul style="list-style-type: none"> <li>• Economic drawback</li> <li>• Children security issues if both are working parents.</li> <li>• Socialization decreases</li> <li>• Loneliness</li> <li>• Security problem</li> </ul>
<b>Joint family/Extended family:</b> It is a type of family structure where several generations of a family, including grandparents, parents, children, and sometimes even aunts, uncles, and cousins, live together under one roof or in close proximity. Multiple nuclear families come together to form a larger household.	<ul style="list-style-type: none"> <li>• Strong support system for all members</li> <li>• Shared responsibilities</li> <li>• Cultural preservation</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of privacy</li> <li>• Differences and conflicts</li> <li>• Generational gaps</li> <li>• Economic instability</li> <li>• Exploitation</li> </ul>

### Childless Family

There are couples who either cannot or choose not to have children. Childless families consist of a husband and wife living with each other.

### Stepfamily

Because of divorce two separate families can merge into one new unit. It consists of a new husband and wife and their children from previous marriages.

### Functions and Role of Family

- Protection, love, and affection
- Reproduction

- Socialization
- Satisfaction of sexual needs
- Economic function

### Characteristics of Healthy Family

- Love
- Trust
- Peace
- Patience
- Kindness
- Gentleness
- Self-control
- Discipline



### KEY POINT

Internalization of norms is the most important aspect of primary socialisation



### Practice Questions

4. Which type of socialization is considered the most essential and basic?
- Primary socialization
  - Secondary socialization
  - Adult socialization
  - Re-socialization

Ans. (a) Primary socialization

5. During which stage of life does primary socialization take place?
- Adult stage
  - Pre-natal stage
  - Childhood stage
  - Adolescent stage

Ans. (c) Childhood stage

6. Which of the following aspects is related to a Joint Family?
- Common property
  - High interaction
  - Big Mess
  - All the above

Ans. (d) All the above

7. What is the term for the marriage of a man with the childless widow of his deceased brother?
- Levirate
  - Sororate
  - Sororal polygyny
  - Polygyny

Ans. (a) Levirate



- **Endomorphs:** Endomorphs have a higher proportion of body fat and a rounder physique. They tend to have a softer, curvier appearance and may struggle with weight management. Endomorphs are often associated with traits such as being more **relaxed, sociable**, and having a **greater affinity for comfort and relaxation**.

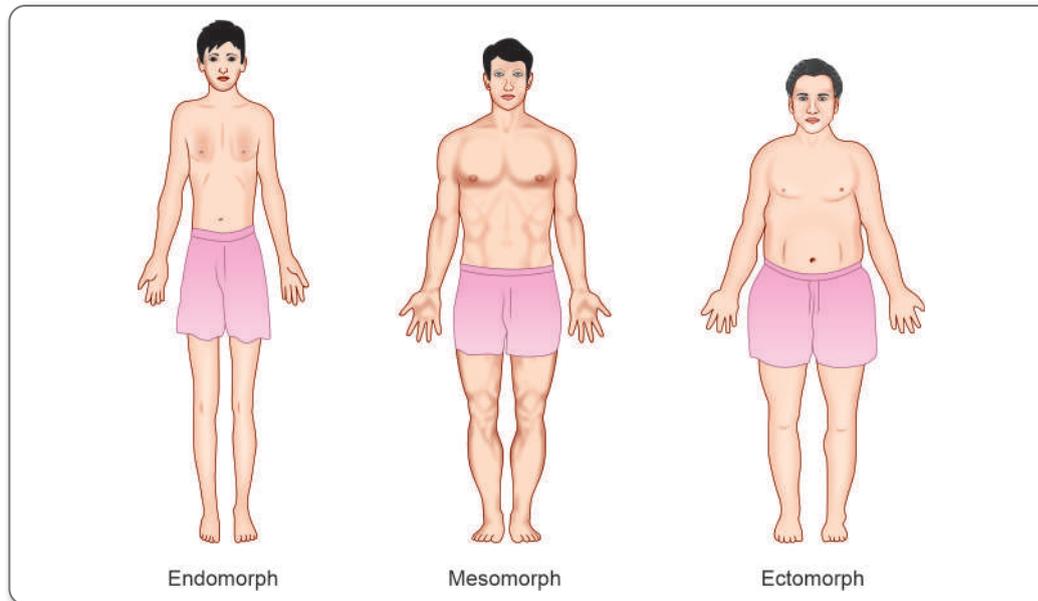


Figure 4: Sheldon's somatotypes, or three body types



## Golden Points to Remember

### APPLIED PSYCHOLOGY

- The term psychology is derived from the Greek words. Psyche meaning social and meaning logos study.
- Psychoanalytic therapy was developed by **Sigmund Freud**
- Psychology is said to be the scientific study of **Behavior** and **Mental Processes**.
- Wilhelm Wundt is the father of experimental psychology.
- Individual psychology was proposed by Alfred Adler.
- **Geopsychology** deals with the physical environment.
- **First psychology lab** was established by Wilhelm Wundt.
- **Legal Psychology** is the branch of experimental psychology.
- Sensory processing disorders (SPD) are neurological disorders causing difficulties to process information from the five primary sense organs.
- Repression is a psychological defense mechanism that operates in the preconscious part of our mind.
- Besides hearing, the auditory system is involved with gait and balance.
- In resting state, the inside of a neuron has a negative electrical charge.
- The hindbrain comprises the vital medulla oblongata.
- Malfunction of the reticular activating system relates to sleeping sickness.
- Reflex actions are initiated by selective impulses in the spinal cord.
- Trisomy 21 leads to Down syndrome.
- Main function of the myelin is to increase the speed of electrical signal transmission along the axon.
- Conflict is defined as opposition or dispute between persons, groups or ideas.
- Creative thinking comprises four stages in the following sequence: Preparation – Incubation – Illumination – Verification.
- **Id** is pleasure principle, in the unconscious domain. Id seeks immediate gratification of its needs and desires, regardless of the consequences
- Ego is reality principle. Ego seeks to satisfy the id's needs in a way that is realistic and does not conflict with the demands of the external world. The ego is conscious and unconscious.
- **Superego** is principle of idealism. It strives for perfection. The superego is unconscious.
- **Morbid jealousy** is a type of pathological jealousy that is characterized by irrational and excessive fear of being betrayed by a partner.
- An adjustment of human beings to the world and to each other is called **mental health**.
- In adolescence, psychological needs for maintaining health and well-being encompass developing a sense of identity, self-acceptance, autonomy, competence, and relatedness.
- Late adulthood involves psychological needs for ego integrity, social support, and spiritual growth
- **Oedipus complex** (given by Sigmund Freud) is seen in boys of 3–5 years of age
- The **Electra complex** is a psychological term introduced by Carl Jung. It is the counterpart to Freud's Oedipus complex and refers to a girl's feelings of attraction toward her father and rivalry with her mother during her psychosexual development.

Contd...

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Golden Points



**“To keep the body in good health is a duty... otherwise we shall not be able to keep our mind strong and clear.”**  
—Buddha



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### APPLIED SOCIOLOGY

#### INTRODUCTION TO SOCIOLOGY

- Who coined the term “sociology” and is considered the Father of Sociology?
  - Karl Marx
  - Auguste Comte
  - Max Weber
  - Emile Durkheim
- Who stated that “Man is a Social Animal”?
  - Aristotle
  - Confucius
  - Plato
  - Socrates
- Which sociologist is known for authoring the book ‘Social Organization: A Study of the Larger Mind’?
  - Charles Cooley
  - EB Tylor
  - Ferdinand Tönnies
  - Émile Durkheim
- Which of the following school of thought believes that the scope of sociology should be limited to the study of social institutions?
  - Formalistic school
  - Synthetic school
  - Symbolic interactionism
  - Structural functionalism

**Explanation:** The formalistic school of thought believes that the scope of sociology should be limited to the study of social institutions, while the synthetic school of thought believes that the scope of sociology should be broader and should include the study of social processes and social interactions.

Symbolic interactionism focuses on the meanings that people give to their social interactions. Structural functionalism is a macro-level theory that focuses on the ways in which society is organized and how different parts of society work together to maintain order and stability.

- Which School of Thought opined that sociology is a general science?
  - Synthetic School
  - Vienna School
  - Formalistic School
  - Scientific School

**Explanation:** The synthetic school of thought in sociology believes that sociology is a general science that studies all aspects of social life. This school of thought was founded by **Émile Durkheim**, who argued that sociology should be a science that studies the social facts, or the things that happen in society, that are beyond the control of any individual.

- Who is associated with the development of positivism, a school of thought in sociology?
  - Bourdieu
  - Auguste Comte
  - Emile Durkheim
  - Montesquieu

- CH Cooley is a prominent sociologist in ..... School of Thought.
  - Formalistic
  - Vienna
  - Mercantilism
  - Chicago
- ..... is an impersonal way of control.
  - Informal
  - Kinship
  - Formal
  - Family

#### INDIVIDUAL

- The process of social interaction by which people acquire the knowledge, attitudes, values, and behaviors essential for significant participation in society is called:
  - Culture
  - Defining the situation
  - Social communication
  - Socialization
- The process of by which an individual is made independent of the group is called:
  - Individualization
  - Growth
  - Development
  - Communication
- Which of the following is not a characteristic of social group?
  - Its members are conscious of shared membership
  - Its members accept certain rights and obligations
  - Its members are a casual collection of people
  - Its members have a distinctive set of interpersonal relations.
- The response of individuals to one another is:
  - Culture
  - Ethos
  - Social interaction
  - None of these

#### FAMILY

- A group of people whose members are related by marriage, or adoption is a (an):
  - Family
  - Institution
  - Friend
  - None of these
- Basic needs of the family include:
  - Need for reproduction
  - Economic needs
  - Psychological and emotional needs
  - All of the above
- The system under which boys and girls are allowed to mix with each other and are given maximum permissible mixing facility by society before marriage is known as:
  - Probationary marriage
  - Experimental marriage
  - Compassionate marriage
  - None of the above



#### Ans.

- b
- a
- a
- a
- a
- c
- d
- b
- d
- a
- c
- c
- a
- d
- a

- 165. Aptitudes are defined as:** (IGNOU PB BSc 2016)
- Preferences to perform certain activities
  - High level of achievement in an area
  - Skills one brings to a given task
  - Abilities of individual to learn in specific endeavor

**Explanation:** Aptitude is a component of a competence to do a certain kind of work at a certain level. Outstanding aptitude can be considered “talent”. An aptitude may be physical or mental. Aptitude is outcome of both inborn and hereditary potential to do certain kinds of work whether developed or undeveloped.

- 166. Gradual disappearance of conditioned response to stimuli is referred to as:** (JIPMER 2015)
- Negative conditioning
  - Extinction
  - Delayed conditioning
  - Elimination

**Explanation:**

Extinction	Extinction is the gradual weakening and disappearance of a conditioned response
Negative conditioning	Negative conditioning is the removal of a stimulus after a response.
Delayed conditioning	A form of classical conditioning in which the conditioned stimulus precedes the unconditioned stimulus by a significant time period and the organism learns to withhold its conditioned response
Elimination	Elimination is an aversive stimulus or punishment during which the client is removed from the environment when the desired behavior is being exhibited.

- 167. Ego works based on the:** (DSSSB PHN, 2015)
- Reality
  - Pleasure
  - Perfection
  - Conscience

**Explanation:** The id, ego, superego are the names for the three parts of the structure of human personality given by psychoanalytical theory. Ego is the realistic part that mediates between the desires of the id and the superego. The id is the primitive instinctual part of mind which operates on pleasure principle. The superego (perfection) is the aspect of personality that holds all of our internalized moral standards and ideals that we acquire from both parents and society.

Structure of personality	Principle
Id	Pleasure
Ego	Reality
Superego	Perfection

- 168. Psychology is a:** (Safdarjung NO 2018)
- Natural science
  - Physical science
  - Biological science
  - Social science

**Explanation:** Psychology is a natural science. “Natural science” means a branch of science that is concerned with the description, prediction and understanding of natural phenomena (based on observation and empirical evidence) -- and it can be seen in psychology.

- 169. Psychology as a ‘Science of Mind’ is defined by:** (Safdarjung NO 2018)
- Psychoanalysts
  - Behaviorists
  - Functionalists
  - Ancient Greek Philosophers

**Explanation:**

School/System of Psychology	Definition
Psychoanalysts	Psychoanalysis is the school of psychology that focuses on treating mental disorders by recognizing the relationships between the conscious mind and the unconscious mind. Proponent of this school of psychology is William James.
Functionalists	Functionalists focused on the purpose of consciousness and behavior.
Behaviorists	A school of psychology that confines itself to the study of observable and quantifiable aspects of behavior and excludes subjective phenomena, such as emotions or motives.
Ancient Greek philosophers	Study of mind as a function of bodily processes. They are due to brain pathology.

- 170. EB Titchener (1867-1927) defined ‘Psychology’ as the science of:** (Safdarjung NO 2018)
- Conscious Experience
  - Science of Mind
  - Science of Experience
  - Science of Soul

**Explanation:** EB Titchener coined the terms: structural psychology and functional psychology. **Titchener** concluded that there are three essential elements that make up all **conscious experiences**: feelings, sensations, and images.

**Table:** Other definitions along with their authors

Definition of Psychology	Given by
Science of Mind	William James
Science of Soul	Rudolf Geöckle
Science of Experience	Carl Rogers Abraham Maslow

- 171. ‘Psychology’ as the scientific study of activities of organism in relation to its environment is defined by:** (Safdarjung NO 2018)
- JB Watson
  - Sigmund Freud
  - Woodworth
  - William James

**Explanation:**

**Table:** Definition of psychology given by various theorists

Theorists	Definition of Psychology
Woodworth	Psychology’ as the scientific study of activities of organism in relation to its environment.
William James	Psychology as Study of Mind
Sigmund Freud	This school of thought emphasized the influence of the unconscious mind on behavior.
JB Watson	Scientific study of behavior and mental processes.

165. d

166. b

167. a

168. a

169. a

170. a

171. c

**Ans.**



"Ill-health of body or of mind, is defeat. Health alone is victory."

—Thomas Carlyle

CHAPTER

# 11



## NURSING RESEARCH AND STATISTICS

### SYNOPSIS

#### INTRODUCTION

Nursing research provides evidence used to support nursing practices, education, administration and management.

#### DEFINITION

Nursing research is a planned attempt to increase nursing knowledge by the discovery of new facts through systematic enquiry.

#### STEPS IN THE QUANTITATIVE RESEARCH PROCESS

##### Conceptual Phase

- Formulating and delimiting the problem.
- Reviewing the literature.
- Developing a theoretical framework.
- Identifying the research variables.
- Formulating hypotheses.

##### Design and Planning Phase

- Selecting a research design.
- Specifying the population.
- Operationalizing the variables.
- Conducting the pilot study/making revisions.

##### Empirical Phase

- Selecting the sample
- Collecting the data
- Organizing data for analysis

##### Analytic Phase

- Analyzing the data
- Interpreting the results

##### Dissemination Phase

- Communicating results

#### STEPS IN THE QUALITATIVE RESEARCH PROCESS

- Define/clarify broad topic
- Review of the literature
- Identify site/setting
- Obtain access
- Obtain and test equipment
- Begin data collection/analysis
- Identify themes/categories
- Triangulation/saturation
- Formulate hypotheses/theories
- Communicate findings

#### RESEARCH PROCESS

##### Research Problem

- It is the first step in research process.
- A research problem is a question that researcher wants to answer or a problem that a researcher wants to solve.
- Research problem to be developed, components etc

##### Review of Literature

Review of Literature (ROL) is a systematic way of presentation of relevant references along with brief findings in the specific juncture for the proposed study or research proposal.

##### Sources of Review of Literature

- **Primary sources:** A primary source provides direct or first-hand evidence about an event, object, person, or work of art. Examples include:
  - Historical and legal documents
  - Original research articles found in Scholarly journals
  - Published thesis
  - Eyewitness accounts
  - Results of experiments

#### Recent Questions (INC PhD 2020)



1. Which among the following is not an appropriate research area?

- Abortion mortality as a method of contraceptive
- Postpartum contraceptive methods
- Initiation of breastfeeding immediately after delivery
- Low birth weight babies and their outcomes

Ans. (a) Abortion mortality as a method of contraceptive.

2. In Vancouver style et al is used after how many authors?

- 3
- 6
- 8
- 10

Ans. (b) 6



#### KEY POINT

A research proposal is a document proposing a research project.

- Statistical data
- Pieces of creative writing
- Audio and video recordings, speeches, and art objects
- Interviews, surveys, and fieldwork
- Internet communications via E-mail, blogs, LISTSERV, and newsgroups
- **Secondary sources:** Secondary sources describe, discuss, interpret, comment upon, analyze, evaluate, summarize, and process primary sources. For example:
  - Articles in newspapers or popular magazines.
  - Book or movie reviews.
  - Articles found in scholarly journals that discuss or evaluate someone else's original research.
- **Types of sources**
  - **Print sources:** Information gathered from printed materials including journals, magazines, textbooks, etc.
  - **Electronic sources:** Information gathered from electronic media such as internet, CD, online journals, blogs, etc. Some of the electronic databases for nursing research are given below.
  - **Ovid MEDLINE:** Literature in the fields of medicine, nursing, dentistry, and preclinical sciences.
  - **Ovid CINAHL (Cumulative index to Nursing allied Health Literature):** Literature related to nursing and allied health disciplines including medical records, physical and occupational therapy.
  - **PubMed:** The US National library of medicine database of biomedical citation and abstracts that is searchable on the website at no cost.
  - **MEDLINE** is the largest component of Pubmed.
  - Cochrane Library.

## Research Variables

A **variable** is a measurable characteristic that varies. It may change from group to group, person to person, or even within one person over time.

- **Dependent variables:** These are the variables which changed according to the independent variable, e.g., A study to assess the effect of hand grip exercises on BP of prehypertensive client. Here dependent variable is BP of prehypertensive client.
- **Independent variables:** These are the variables manipulated by the researcher. Researcher has good control over these variables, e.g., A study to assess the effect of hand grip exercises on BP of pre-hypertensive client. Here independent variable is hand grip exercises
- **Extraneous variables:** These are factors in the research environment which may have an effect on the dependent variable(s) but which are not controlled. Extraneous variables may damage

a study's validity, making it impossible to know whether the effects were caused by the independent or some extraneous (not measured) factor. If they cannot be controlled, extraneous variables must at least be taken into consideration when interpreting results.

- **Confounding variables:** Extraneous variables become confounding variable if there is an academic evidence that the extraneous variable (which was not measured in the study) has influence (or relationship) on dependent variable.
- **Continuous variables:** These variables can take an infinite range of values along a continuum, e.g., weight in kg.
- **Discrete variables:** They are having a finite number of values between two points, e.g., number of children
- **Categorical variables:** They do not represent quantity or numerical value, e.g., Nominal variable: Gender (male, female), Religion (Hindu, Muslim, Christian), etc.
- **Ordinal variables:** Severity of disease (mild, moderate, severe), Socio-Economic status, e.g., poor, middle class, upper middle class, affluent.

## Examples to Explain all These Four Variables

- **Study title:** The impact of teaching style (lectures/seminars) on exam performance of students.
- **Independent variable (IV):** Teaching style (either lectures or seminars).
- **Dependent variable (DV):** Exam performance of students (statistics exam ranging from 0 to 100 marks).
- **Extraneous variables:** Quality of lecturer and tiredness of students; the researcher was not indented to measure these variable in his/her research.
- **Confounding variables:** If researcher found academic evidence (from research articles from scholarly journals) that quality of the teacher or tiredness of student will affect the exam performance, then **these two variables may be called confounding variables**. Because the researcher cannot be sure that only the independent variable (teaching style) has caused changes in students' performance.

## Objectives

- A research objective is a clear, concise, declarative statement which provides direction to investigate the variables.
- The objectives of a research project summarize what is to be achieved by the research.

### Characteristics of research objectives:

- A well-framed objective will be SMART
  - S - Specific
  - R - Realistic
  - M - Measurable
  - T - Time-bound
  - A - Attainable



## KEY POINTS

- **A literature review is everything that is known about subject.**
- In quantitative research studies, the literature review should occur early in the research process.



## Recent Question (INC PhD 2020)

**3. Characteristics of research objective are all; EXCEPT:**

- a. Measurable
- b. Testability
- c. Time bound
- d. Equivocal

**Ans. (d) Equivocal**



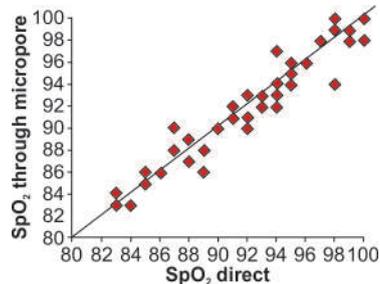
## KEY POINT

A research objective must be SMART (Specific, Measurable, Attainable, Realistic and Time-bound).



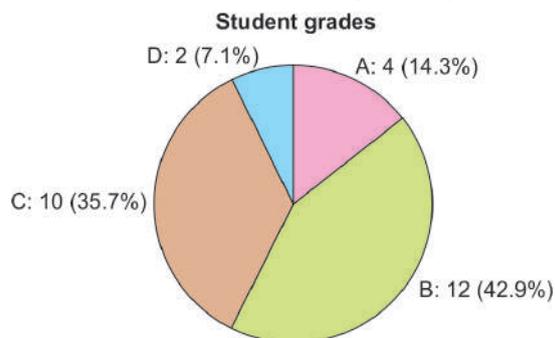
# ? Image-Based Questions

1. SpO<sub>2</sub> measurement taken with and without micropore in a pediatric population is depicted in the following scattered plot diagram. Which of the following is true? [AIIMS November 2016]



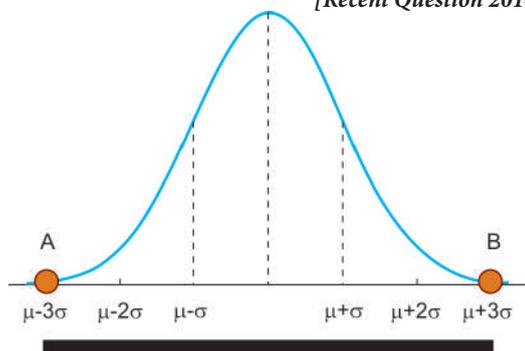
- There is no agreement between two measurements
- There is a negative correlation between two measurements
- There is no association between the two measurements
- There is a positive correlation between two measurements

2. Identify the statistical diagram shown in photograph. [Recent Question 2017]



- Pie chart
- Pictogram
- Scatter diagram
- Ogive

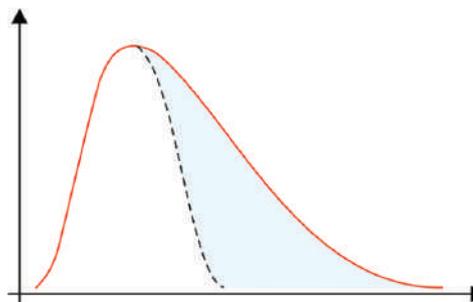
3. In the diagram depicted here, how much is the area between points A & B, on either side of the mean? [Recent Question 2016]



- 68.3%
- 95.4%
- 99.7%
- 102.5%

4. In the following type of distribution.

[Recent Question 2016]



- Mean = Median = Mode
- Mean > Median > Mode
- Mode > Median > Mean
- Median > Mode > Mean

5. Identify the epidemiological study design.

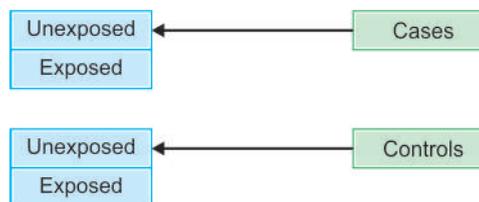
[Recent Question 2014]



- Cohort study
- Case Control study
- Cross Sectional study
- Nested Case Control study

6. Identify the epidemiological study design.

[Recent Question 2013]



- Cohort study
- Case Control study
- Cross Sectional study
- Nested Case Control study



Ans.

- d
- a
- c
- b
- a
- b

“Health is the greatest of all possessions; a pale cobbler is better than a sick king.”

—Isaac Bickerstaff



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION & DEFINITIONS

1. The terminology used to explain the number of subjects recruited to participate in a study decline during a course of the project:

(AIIMS Raipur NO 2019)

- a. Variability
- b. Heterogenetic
- c. Homogeneity
- d. Attrition

**Explanation:** Attrition means “wearing away” or progressive loss of data in research. It occurs when cases are lost from a sample over time or over a series of sequential processes. Sample attrition is commonly expected in a longitudinal studies or experimental studies.

2. The subject in a research study behaves in a particular manner because they are aware that they are being observed.

This is called:

(AIIMS Raipur NO 2019)

- a. Hawthorne effect
- b. Experimental effect
- c. Reactive effect
- d. Novelty effect

**Explanation:** Hawthorne effect refers to the tendency of subjects to perform better when they are aware that they are being observed.

**Experimental effect:** Researcher’s characteristics influence subject behavior.

**Reactive effect:** Reactive effect of pretest sensitivity on the posttest.

**Novelty effect:** Subjects and researcher might behave in different ways when exposed to new treatment.

3. A nurse who reads research articles and incorporates research findings into clinical practice is a:

- a. Consumer
- b. Primary investigator
- c. Co-investigator
- d. Collaborator

4. Contributions of Florence Nightingale to nursing research is:

- a. Case study approach
- b. Conceptual Framework for research
- c. Data collection and analysis
- d. Qualitative research method

5. The researcher uses which portion of the research report to capture the reader’s attention?

- a. Abstract
- b. Methodology
- c. Results
- d. Review of Literature

6. The sentence “The purpose of this study was to examine the relationship between knowledge and pre-operative anxiety among patients undergoing abdominal surgery” would most likely be found in which chapter of a research dissertation?

- a. Introduction
- b. Review of Literature
- c. Methodology
- d. Data Analysis and Interpretation

7. Feasibility of a research study is determined by examining:

- a. Investigator’s credibility
- b. Availability of subjects
- c. Importance of research problem
- d. Previous research evidences

8. The researcher has written in his research proposal that written permission has been obtained from two local hospitals to access their staff nurses for data collection. This is an example of what aspect of a research:

- a. Reliability
- b. Validity
- c. Ethics
- d. Feasibility

**Explanation:** Validity and reliability are related to assessment of measurement tools for its appropriateness and consistency respectively. Obtaining permission from a hospital to access their employees for data collection is part of feasibility in conducting the research. Obtaining permission from study participants and institutional ethical committee (including hospital ethics committee) are related to ethical aspect of a research study. So, obtaining permission from hospitals is more closely associated with feasibility than ethics.

9. “Abstract” in research is defined as:

- a. Specific and particular
- b. General and not well-defined
- c. Precise and well-defined
- d. Concrete and specific

10. Who is the first nurse researcher?

- a. Martha Rogers
- b. Dorothea Orem
- c. Florence Nightingale
- d. Sr. Callista Roy

11. Condition or characteristic that can take on different values or categories is called a:

- a. Constant
- b. Variable
- c. Cause-and-effect relationship
- d. Descriptive relationship

12. All of the following are examples of grand theory; EXCEPT:

- a. Interpersonal Model
- b. Community Empowerment Model
- c. Health Belief Theory
- d. Maslow’s Hierarchy Needs Theory

13. The theories are:

- a. Based on preexisting facts
- b. Testable
- c. Formulated prior to research
- d. Derived from issues

14. Inductive theories are based on conclusion drawn by:

- a. Testing theories
- b. Moving from general to specific
- c. Moving from specific to general
- d. General observations

### Ans.

- 1. d
- 2. a
- 3. a
- 4. c
- 5. a
- 6. a
- 7. b
- 8. d
- 9. b
- 10. c
- 11. b
- 12. b
- 13. b
- 14. c

15. Theories are
- Already existing
  - Formulated and keep on changing
  - Stagnant and never change
  - None of the above
16. Research paradigm is:
- Conceptual framework
  - Theoretical framework
  - Study framework
  - None of the above
17. Nursing research can be based on:
- Only nursing theories
  - Theories from other disciplines
  - Both a and b
  - None of the above
18. A study of experiences is called:
- Phenomenology
  - Ethnography
  - Action research
  - Grounded theory
19. The group of study participants that does not receive the intervention is known as:
- Control group
  - Experimental group
  - Randomized group
  - Subjects
20. Subset of a population is called as:
- Study population
  - Target population
  - Sample
  - Unit
21. The first annotated index of nursing research was the work of:
- Dorothea Orem
  - Florence Nightingale
  - Denise Polit
  - Virginia Henderson
22. Who was the first to use the word "Statistics"?
- (Safdarjung NO 2018)*
- Gottfried Achenwall
  - Prof. Horace Secrist
  - Croxtan and Cowden
  - Gelan

**Explanation:** The word statistics was first used by a German scholar Gottfried Achenwall in the middle of the 18<sup>th</sup> century as the science of statecraft concerning the collection and use of data by the state.

23. The indices calculated from a sample is called as:
- Parameter
  - Statistics
  - Conclusion
  - Inference
24. The method of statistics that is used to draw conclusion from a data collected from a sample of population instead of entire population is referred as:
- Descriptive statistics
  - Inferential statistics
  - Census statistics
  - Population survey
25. The statistical approach used to test whether the outcome of the study is a result of factors planned within design of the study is called:
- Analytical statistics
  - Descriptive statistics
  - Inferential statistics
  - All of these
26. The statistical method that is used to explain and summarize a specific set of data is known as:
- Inferential statistics
  - Descriptive statistics
  - Theme identification
  - None of these
27. Health Adjusted Life Expectancy is a measure of:
- Mortality
  - Disability
  - Fertility
  - Reproduction Rate
28. Number of existing cases of a disease during a given time interval gives:
- Point prevalence
  - Incidence
  - Period prevalence
  - None of these
29. The number of new cases that occur within a specific population within a defined time interval is:
- Incidence
  - Point Prevalence
  - Period prevalence
  - Lifetime Prevalence
30. Full form of SPSS is:
- Statistical Package for Social System
  - Statistical Programme for Social Sciences
  - Statistical Package for Social Sciences
  - Statistical Programme for Scientific Studies

## STEPS & PHASES IN RESEARCH PROCESS

31. Which of the following is NOT a common feature of both research process and nursing process?
- Identifies new information
  - Involves critical thinking
  - Has a broader focus
  - Utilizes complex thinking

**Explanation:** Research has a broader focus and involves generalizability of findings, whereas nursing process is client-focused and not generalized to all patients/population. Other three features are common to research and nursing process.

32. The specific aim or goal of the research study based on the identified problem is termed as:
- Purpose
  - Assumptions
  - Operational definition
  - Methodology
33. The first step of the Research Process is to:
- Prepare the Research Design
  - Complete Data Collection and Analysis
  - Formulate the Research Questions
  - Prepare the Report
34. Which of the following is not the purpose of pilot study?
- Tool refinement
  - Fine tune the data collection process
  - Help in sample size calculation
  - Drawing final inferences
35. PICO means:
- Population, intervention, comparison, outcome
  - Prevalence, incidence, cohort, observation
  - Polio, influenza, chickenpox, ovulation
  - Patient, injection, catheterization, operation
36. The initial and one of the most significant steps in conducting the research process is:
- Defining the research variables
  - Identifying the research problem
  - Stating the research purposes.
  - Determining the feasibility of the study
37. Problem identification in the research process would be equivalent to which step in the nursing process?
- Nursing assessment
  - Planning
  - Implementation
  - Evaluation
38. The major objective of conducting a basic research is to:
- Develop knowledge for immediate use
  - Develop theories and principles
  - Make a decision
  - Provide a solution for existing problems
39. The development of a solid foundation of reliable knowledge is typically built from:
- Action research
  - Basic research
  - Developmental research
  - Methodological research



Ans.

- |     |   |
|-----|---|
| 15. | b |
| 16. | a |
| 17. | c |
| 18. | a |
| 19. | a |
| 20. | c |
| 21. | d |
| 22. | a |
| 23. | b |
| 24. | b |
| 25. | c |
| 26. | b |
| 27. | b |
| 28. | c |
| 29. | a |
| 30. | c |
| 31. | c |
| 32. | a |
| 33. | c |
| 34. | d |
| 35. | a |
| 36. | b |
| 37. | a |
| 38. | b |
| 39. | b |

“Health is the greatest of all possessions; a pale cobbler is better than a sick king.”

—Isaac Bickerstaff

CHAPTER

# 12



## NURSING EDUCATION

### SYNOPSIS

#### EDUCATION

It brings change in behavior of an individual in a desirable manner. It aims at all-round development of an individual.

#### Philosophies of Education

The term ‘Philosophy’ has been derived from two words, i.e., “philos” means ‘love’ and “sophia” means ‘wisdom’. Philosophy means love for wisdom.

#### Traditional Philosophies

**Table 1:** Traditional Philosophies: Some facts

Character	Naturalism	Idealism	Pragmatism (Experimentalism)	Realism
Exponents	<ul style="list-style-type: none"> <li>• Aristotle</li> <li>• JJ Rousseau</li> </ul>	<ul style="list-style-type: none"> <li>• Plato is father of Idealism</li> <li>• Socrates, Kant, Hegel, Guru Nanak, Tagore, Mahatma Gandhi, Dayananda and others.</li> </ul>	<ul style="list-style-type: none"> <li>• William James is the father of Pragmatism</li> <li>• John Dewey, S. Kil Patrick</li> <li>• Margaret H and Mead</li> </ul>	<ul style="list-style-type: none"> <li>• J Friedrich Herbert</li> <li>• Herbert Spencer</li> <li>• Franklin Bobbitt</li> </ul>
Fundamental principles	<ul style="list-style-type: none"> <li>• Separate nature from God</li> <li>• Human life is part of nature</li> <li>• Emphasize ‘matter and the physical world’</li> <li>• Ignore spirituality and supernaturalism</li> </ul>	<ul style="list-style-type: none"> <li>• Ideas or thoughts make up fundamental reality</li> <li>• Ultimate reality is spiritual rather than physical, mental or material</li> <li>• The only real things are mental entities, not physical things</li> </ul>	<ul style="list-style-type: none"> <li>• It is the product of practical experiences of life</li> <li>• Based on practical utility.</li> <li>• Emphasize is on action rather than on thought</li> <li>• Experimental method of science</li> </ul>	<ul style="list-style-type: none"> <li>• Correspondence and sensation (as we see it).</li> <li>• What is true and real in daily life is admissible</li> <li>• Opposes to idealism</li> <li>• Against spiritualism</li> </ul>
Aims of Education	Self-realization, Self-expression, Self-preservation, Struggle for existence	Idealism emphasizes the glory and grandeur of human life.	Creation of new values, activity and experience, personal and social adjustment, reconstruction of experience, all-round personality development	Man leads a happy and comfortable life through education. To develop memory of the child.
Curriculum	No fixed curriculum. Every child has the right to determine his/her curriculum. Learn directly from nature through experience	Based upon ideas and ideals. Language, literature, social studies, science and mathematics are included	Curriculum is fixed in advance at the beginning itself. Utilitarian curriculum includes subjects that impart knowledge and various types of skills. Practical subjects like social studies, physics, maths and hygiene are included at later stage.	Subjects of physical world: mathematics, science and social science

Contd...

Character	Naturalism	Idealism	Pragmatism (Experimentalism)	Realism
Methods of teaching	Observation and experimental methods (Learning by doing)	Self-activity, play way method, project method. <b>Kindergarten</b> method. Discussion, lecture, questioning and imitation.	Project method Practical/experiments Handling of objects, tools and making things	Demonstrate, Recite
Role of teacher	Observer, supplier of materials and opportunities (role is behind the scene)	Teacher has to be specialist in knowledge. Teacher's personality is a source of inspiration for students.	Teacher will not impose anything on child. Teacher will facilitate students to be experimenter and discoverer	Displays, imparts knowledge.

### Modern Contemporary Philosophies

- **Existentialism:** This philosophy emphasizes the existence of the humans as a free and responsible agent determining their own development through acts of the will. It is the youngest of all philosophy, primarily built upon the work of contemporary scholars of the 20<sup>th</sup> century. Chief exponents are **Soren Kierkegaard**, **Karl Jaspers** and **Jean-Paul Sartre**
- **Progressivism:** It is the advocacy of improvement of society by reform. Progressivism revolves around the students' needs, including teaching students to be good citizens as well as good learners. Exponents are John Dewey, William James, G Thomas Lawrence.
- **Behaviorism:** It believes that the learning is a result of environmental conditioning. Exponents are Ivan Pavlov (classical conditioning), Skinner (Operant conditioning), John Watson, and Edward Lee Thorndike (connectionism)
- **Humanism:** It emphasizes the value of human beings and generally prefers critical thinking and evidence (rationalism and empiricism) over superstition. The humanist emphasizes on literature. Key proponents of humanism include **Carl Rogers** and **Abraham Maslow**.
- **Experimentalism:** Experimentalism believes that things are constantly changing. Chief proponent is John Dewey.
- **Eclecticism:** It is the process of pulling out and putting together of the good ideas and concepts of various philosophies of education.
- **Reconstructionism:** It emphasizes the addressing of social questions and a quest to create a better society and worldwide democracy. Theodore Brameld was the founder of reconstructionism.
- **Essentialism:** Essentialism refers to the "traditional" or "Back to the Basics" approach to education.

### INDIAN NURSING COUNCIL (INC)

- Indian Nursing Council is a national regulatory body for nurses and nursing education in India. Indian Nursing Council is an autonomous body under the Government of India.
- Indian Nursing Council was established by Government of India under section 3(1) of the INC Act 1947.
- Important functions of INC:
  - To maintain uniform standard of nursing education in India
  - To prescribe the syllabus and regulations for nursing programs
  - To recognize the qualifications for the purpose of registration and employment
  - To advise State Nursing Councils, Central Government, State Governments, and Examining boards regarding Nursing education in India
- Minimum required physical facilities for a nursing college with an intake of 60 students (Key points)
  - Teaching block
    - Lecture hall:  $4 \times 1080 = 4320$  sq. ft
    - Nursing foundation lab: 1500 sq. ft
    - Other labs (nutrition, CHN, OBG/ Pediatric, pre-clinical science): 900 sq. ft each
    - Library: 2400 sq. ft
    - Staff Room: 1000 sq. ft
    - Faculty Room: 2400 sq. ft
    - A.V Aids room: 600 sq. ft
    - Total area (Teaching block): 23720 sq. ft
  - Hostel Block
    - Rooms (single/double): 24000 sq. ft
    - One toilet and one bathroom for every 5 students
    - Recreation room: 500 sq. ft
    - Dining Hall : 3000 sq. ft



### KEY POINTS

- **Plato** is the Father of Idealism. Other proponents of Idealism include Socrates, Kant, Hegel, Guru Nanak, Tagore, Mahatma Gandhi, Dayananda and others.
- **Aristotle and JJ Rousseau** are the proponents of Naturalism.
- **Naturalism** emphasizes 'matter and the physical world'. It ignores spirituality and supernaturalism.
- **William James** is the Father of Pragmatism. Other proponents of pragmatism include **John Dewey** and **S. Kil Patrick**.
- Pragmatism emphasizes action rather than thought.
- J Friedrich Herbert, Herbert Spencer and Franklin Bobbitt are proponents of Realism.
- Idealism believes that ultimate goal of human activities is the realization of human mind in his or herself.



“The groundwork for all happiness is good health.”

—Leigh Hunt



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### HISTORY OF NURSING EDUCATION IN INDIA

1. MPhil in Nursing program was started at RAK College of Nursing in the year:

- a. 1972                      b. 1980  
c. 1986                      d. 1992

New Q

2. PhD program in Nursing was first started in India in:

- a. 1980                      b. 1985  
c. 1992                      d. 1996

New Q

3. National Consortium for PhD in Nursing in India was initiated by:

- a. AIIMS, New Delhi  
b. RAK College of Nursing, New Delhi  
c. Indian Nursing Council  
d. IGNOU

New Q

4. In India, the first four-year basic Bachelor Degree nursing program was established in:

- a. 1920                      b. 1940  
c. 1946                      d. 1955

**Explanation:** The first four-year Basic BSc program was established in 1946 at RAK College of Nursing in Delhi and CMC College of Nursing in Vellore.

### REGULATORY AND PROFESSIONAL BODIES

5. The function of Indian Nursing Council is to:

- a. Arrange for university inspections of colleges in respective states  
b. Financial assistance to conferences and seminars conducted by nursing colleges  
c. Make policies for Nursing Education and Practice  
d. Recruit nursing personnel in hospitals

6. Trained Nurses Association of India (TNAI) was formed in the year:

- a. 1928                      b. 1947  
c. 1908                      d. 1890

7. The International Council of Nurses (ICN) was established in the year: (Tutor Exam 2015, AIIMS, Rishikesh)

- a. 1869                      b. 1899  
c. 1928                      d. 1905

8. The International Council of Nurses (ICN) is headquartered in:

- a. Geneva, Switzerland  
b. Washington, US  
c. New York, US  
d. London, UK

### NURSING PROGRAMS IN INDIA

9. In India, first MSc Nursing programme was started in RAK college in the year: (Tutor Exam 2015, AIIMS, Rishikesh)

- a. 1959                      b. 1948  
c. 1946                      d. 1970

### EDUCATIONAL OBJECTIVES

10. Who stated “education is not a preparation for life; education is life itself”?

- a. Jean Piaget  
b. Socrates  
c. John Dewey  
d. Mahatma Gandhi

11. “Democracy and Education” (1916) was authored by:

- a. Sigmund Freud                      b. John Dewey  
c. Jean Piaget                      d. Jawaharlal Nehru

12. The interaction analysis category system in education for increasing the teacher effectiveness was developed by:

- a. Amidon                      b. Simon  
c. Flander                      d. Richard Over

13. Who stated that “Man is born free but every-where he is in chains”?

- a. Jean Jacques Rousseau                      b. Sigmund Freud  
c. John Dewey                      d. Jean Piaget

14. “By ‘Education’ I mean an all-round drawing out of the best in child and man body, mind and spirit”. This quotation is given by:

- a. Rabindranath Tagore                      b. Mahatma Gandhi  
c. Sarvepalli Radhakrishnan                      d. Jawaharlal Nehru

15. The cognitive domain in educational objectives refers to: (AIIMS Raipur NO 2019):

- a. Knowledge                      b. Attitude  
c. Skills                      d. Behavior

**Explanation:** There are three domains of educational objectives that are cognitive, conative and affective.

- **Cognitive domain:** It has different levels like knowledge, comprehension, application, analysis, synthesis and evaluation.
- **Psychomotor domain:** Related to skills. Three levels are imitation, control, and automatism.
- **Affective domain:** Dealing with emotions or feelings (behavior). Three levels are attention, response, internalization.

16. A principle of adult learning is:

- a. Learning is self-directed                      b. Learning by doing  
c. Learning by imposition                      c. Learning by imitation

Ans.

1. c  
2. c  
3. c  
4. c  
5. c  
6. c  
7. b  
8. a  
9. a  
10. c  
11. b  
12. c  
13. a  
14. b  
15. a  
16. a

“Better ten times ill than one time dead.”

—Yiddish

CHAPTER

# 13



## NURSING ADMINISTRATION AND MANAGEMENT

### SYNOPSIS

#### ORGANIZATION

A systematic arrangement of people brought together to accomplish some specific purpose/goal.

#### ADMINISTRATION

It is the organization and direction of human and material resources to achieve desired goals. (Piffner & Presthus)

#### MANAGEMENT

Process of getting things done efficiently and effectively through and with other people.

#### Levels of Management

- Top Managers
- Middle Managers
- First-Line Managers

#### Theories of Management

1. Classical Management Perspective
2. Behavioral Management Perspective
3. Quantitative Management Perspective

#### 1. Classical Management Perspective

It includes both scientific management and administrative management.

- Concerned with improving the performance of individual workers (i.e., efficiency).
- A theory that focuses on managing the organization as a whole.

#### Scientific Management

##### Frederick Taylor

- Father of scientific management
- Replaced the old rule-of-thumb method.
- Believed in selecting, training, teaching and developing workers.

- Used time study, standards planning, exception rule of management, slide-rules, instruction cards, incentives, etc.

##### Frank and Lillian Gilbreth

- Reduced number of movements in bricklaying, resulting in increased output of 200%.

##### Henry Gantt

- Developed other techniques, including the Gantt chart, to improve working efficiency through planning/scheduling.

#### Administrative Management Theory

- Focuses on managing the organization.

##### Henri Fayol

- Wrote General and Industrial Management
- Helped to systematize the practice of management
- First to describe management as planning, organizing, leading and controlling.

#### Fayol's 14 Principles of Management

- Division of labor
- Authority
- Discipline
- Unity of command
- Unity of direction
- Subordination of individuals to the common good
- Remuneration
- Centralization
- Scalar chain
- Order
- Equity
- Stability
- Initiative
- *Esprit de corps*

#### 2. Behavioral Management Perspective

- Emphasizes individual attitudes and behaviors and group processes.



#### KEY POINTS

- The administration is defined as an act of administering the whole organization by a group of people. (Top Level)
- Management is a systematic way of managing people and things **within the organization**. (Middle and lower level)



#### Practice Question

1. Which of the following is NOT one of the Fayol's principles of Management?

- a. Centralization
- b. Formal rules
- c. Division of labor
- d. Discipline

Ans. (b) Formal rules

- Recognizes the importance of behavioral processes in the workplace.
- **The Hawthorne Studies**
  - Conducted by Elton Mayo and associates at Western Electric (1927–1935)
  - Group study: The effects of a piecework incentive plan on production workers
    - Workers established informal levels of acceptable individual output.
- Over-producing workers were labeled “rate busters” and under-producing workers were considered “chiselers.”
- Interview program
  - Confirmed the importance of human behavior in the workplace.
- **Human Relations Movement**
  - Perspective that workers respond primarily to the social context of work
  - Abraham Maslow
    - Posited a hierarchy of needs

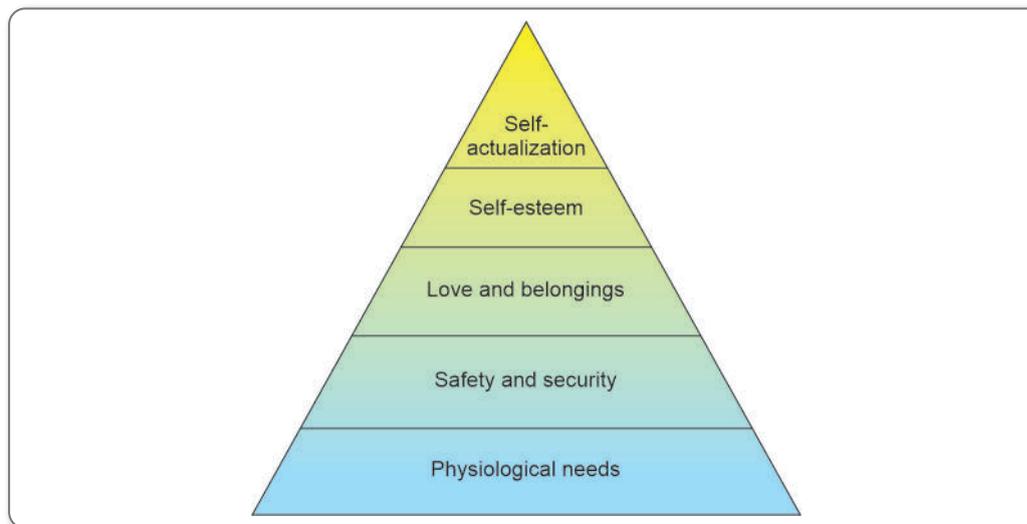


Figure 1: Hierarchy of needs

### Douglas McGregor

- Proposed Theory X and Theory Y concepts of managerial beliefs.

#### Theory X

- People do not like work and try to avoid it.
- People do not like work, so managers have to control, direct, coerce, and threaten employees to get them to meet organizational goals.
- People prefer to be directed, to avoid responsibility and to want security; they have little ambition.

#### Theory Y

- Work is a natural part of people's lives.
- People are internally motivated by commitment.
- People are committed to goals to the degree they receive rewards.
- People will seek and accept responsibility.
- People have the capacity to be innovative.
- People are bright, but mostly under-utilized.

### Max Weber Theory of Bureaucracy

Used to describe a structure based on sociological concept of rationalization of collective activities.

### Features of Bureaucracy

- Clear division of labor
- Hierarchical management of position
- Formal rules and regulation
- Impersonal relationship
- Employment based entirely on technical competence.

### Organizational Behavior

- A contemporary field focusing on behavioral perspectives of management.
- Organizational behavior research
  - Job satisfaction
  - Job stress
  - Motivation and leadership
  - Group dynamics and organizational politics
  - Interpersonal conflict
  - Design of organizations
- **Five Functions of Management**
  - Planning
  - Organizing
  - Coordinating
  - Directing
  - Controlling



### Practice Question

2. All of the following are the elements of management; EXCEPT:

- Controlling
- Organizing
- Staffing
- Commanding

Ans. (d) Commanding



### KEY POINTS

- The Famous 14 Principles of management was proposed by Henry Fayol
- “Esprit de corps” refers to **Sense of belonging**. It is one of the Fayol's 14 principles of management.
- Theory X and Theory Y of management were proposed by Douglas McGregor
- Father of Scientific Management is **Fred-eric Winslow Taylor**.
- **Max Weber**: Theory of Bureaucracy.



### Recent Question (INC PhD 2020)

1. Successive levels of authority in an organization represents

- Hierarchy
- Span of control
- Unity of command
- Division of labor

Ans. (a) Hierarchy



**“As I see it, every day you do one of two things: build health or produce disease in yourself.”**  
—Adelle Davis



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION TO NURSING ADMINISTRATION & MANAGEMENT

1. Which of the following is NOT the principle of organization?  
(RAK MSC 2018)

- a. Hierarchy
- b. Delegation
- c. Span of control
- d. Pervasiveness

**Explanation:** Pervasiveness is not the principle of the organization. There are six principles of organization given by Henri Fayol (1947)

- Hierarchy
- Span of control
- Integration Vs Disintegration
- Centralization Vs Decentralization
- Unity of Command
- Delegation

2. The level of conversation in which no sharing of oneself occurs is:  
(AIIMS-BBS SNO 2019)

- a. Level 1: Open conversation
- b. Level 5: Cliché conversation
- c. Level 4: Reporting of facts
- d. Level 2: Spontaneous conversation

**Explanation:**

- **Level 5 (cliché conversation)** It is very superficial communication, where there is no communication about their self and everyone remains safe in conversation.
- **Level 1 (Open conversation)** This happens in emotionally open and honest communication.
- **Level 2 (Spontaneous conversation)** Spontaneous thought like what is felt about situation is shared.
- **Level 3 (My ideas or judgment)** Own ideas and opinion are shared.
- **Level 4 (Reporting of facts)** Share facts and expose almost nothing about personal.

3. Which of the following function the LEAST important to a nurse manager?  
(RAK MSc 2018)

- a. Decision-making
- b. Manipulating people
- c. Monitoring subordinates
- d. Effective leading

**Explanation:** Role of Nurse as a Manager include all except manipulating the people, as manipulation involves managing or influence skillfully, especially in an unfair manner.

4. Professional negligence is legally termed as:  
(AIIMS Raipur NO 2019)

- a. Crime
- b. Assault
- c. Malpractice
- d. Slander

**Explanation:**

- Malpractice is a professional liability based on negligence and includes professional misconduct, breach of duty or standard of care, illegal or immoral conduct or failure to exercise reasonable skill, all of which lead to harm.
- **Crime** is an offence and is punishable by law.
- An assault is the act of inflicting physical harm or unwanted physical contact upon a person.
- **Slander** refers to crime of making false spoken statement damaging to a person's reputation.

5. The process that enables one to access a nurse or a physician via telephone or computer is called: (AIIMS BPL NO 2018)

- a. Telehealth
- b. E-Medicine
- c. Quality assurance
- d. Distant consultation

**Explanation:** Telehealth involves the distribution of health-related services and information via electronic information and telecommunication technologies. Distance consultation comes under the ambit of telehealth. **E-medicine** refers to electronic collection of medical information and record about the person that can be stored in the computer.

6. The commission or omission of an act that a reasonably prudent person would have performed in a similar situation thus causing harm to another person is called:  
(AIIMS BPL NO 2018)

- a. Negligence
- b. Libel
- c. Slander
- d. Assault

**Explanation:** An unintentional tort is one that is negligent, as opposed to intentional torts, which are torts done deliberately. Intentional torts include assault, battery, false imprisonment, intentional infliction of emotional distress, libel, slander and trespassing.

7. Which of the following situation is considered as an intentional tort?  
(Safdarjung NO 2018)

- a. Nurse miscounts the gauze pads during a surgery.
- b. Nurse divulges private information about the patient to media.
- c. Nurse causes a burn when applying a warm soak to legs.
- d. Nurse fails to monitor blood pressure when administering an anti-hypertensive to drugs.

**Explanation:** Nurse divulges private information about the patient to media is to be considered as intentional tort. Intentional tort is a civil wrong performed by a person knowingly and the person was also aware of the possible consequences of his/her act.

Miscounting the gauze pads, failure to monitor the vital signs and causing burns while applying warm soaks are examples of negligence or malpractice.



**Ans.**

- 1. d
- 2. b
- 3. b
- 4. c
- 5. a
- 6. a
- 7. b



“An ounce of prevention is worth a pound of cure.”

—Unknown

CHAPTER

# 14



## COMPUTER/HEALTH AND NURSING INFORMATICS

### SYNOPSIS

#### BASIC KEY TERMS

- **Access:** To gain entry to data or reading the data.
- **Analog:** Using signals or information represented by a continuously variable physical quantity such as spatial position, voltage, etc.
- **ASCII:** American Standard Code for Information Interchange.
- **Backup:** Saving any data or information for future.
- **Bios:** Controls input and output operations.
- **Binary:** A **binary** digit, or bit, is the smallest unit of data in computing. It is represented by a 0 or a 1.
- **Bit:** The smallest unit of data in binary.
  - 8 bits = 1 byte
  - 4 bits = 1 nibble
- **Byte:** Byte is a group of binary digits or bits (usually eight) operated on a single unit. A byte is considered as a unit of a memory size.
  - 8 bits = 1 byte
  - 1024 Bytes = 1 kilobyte (KB)
  - 1024 KB = 1 Megabyte (MB)
  - 1024 MB = 1 Gigabyte (GB)
  - 1024 GB = 1 Terabyte (TB)
  - 1000 TB = 1 Petabyte
- **Cache:** It is a hardware or software component that temporarily stores data so future requests for that data can be served faster.

#### GENERATIONS OF COMPUTERS

**Table 1:** Computer generation, period, features and examples

Generation	Period	Features	Examples
First generation	1940–1955	<b>Vacuum tubes</b> and <b>magnetic tapes</b> Slow in speed Very huge in size Limited storage size Punched cards were used to input the data. Processing time for calculation was <b>milliseconds</b>	ENIAC, EDVAC, UNIVAC 1
Second generation	1955–1964	Used <b>Transistor</b> for electronic circuitry. Large in size, relatively slow and expensive Needed air conditioned room as they got heated up very quickly Processing time was <b>microseconds</b>	IBM, 1401, RCA501, Honeywell 200, etc.

Contd...

- **CD ROM (Compact Disk Read Only Memory):** From CD ROM, the data can only be read but not edited, manipulated, or deleted.
- **Chip:** Chip is a short form for ‘microchip’. It is a small piece of semiconducting material implanted with an integrated circuit.
- **Code:** Language expressed or understood by the computer.
- **DOS (Disk Operating System):** It is a command based operating system that runs from a hard disk drive. Most commonly refers to MS-DOS (Microsoft Disk Operating System).

#### HISTORY OF COMPUTERS

- **Charles Babbage** is considered as the “father of the computer”. He originated the concept of a programmable computer (between 1833 and 1871).
- **Microprocessor** was invented by **Ted Hoff, Stanley Mazor and Federico Faggin** (at Intel Inc) in **1970**.
- **Microcomputer** was invented by **H. Edward Roberts** in **1975**.



#### KEY POINTS

- A hard disk is divided into tracks which are further subdivided into sectors.
- The central processing unit consists of Control unit, ALU and CPU.
- RAM (Random Access Memory) is a volatile memory.
- Router is a device used to connect a number of LANs (Local Area Networks).
- Fiber optic cable is used as a high speed network backbone media.
- A bit is the smallest unit of the information.
- Buffer is the temporary storage that can be used to compensate for a difference in data rate and data flow between devices.

Generation	Period	Features	Examples
Third Generation	1964–1975	Used <b>integrated circuits (ICs)</b> Keyboards and monitors were invented for input and output Operating system (OS) was designed. PASCAL (high level language) was developed. Processing time was <b>nanoseconds</b>	IBM 360 series and 370 series
Fourth Generation	1975–1980	Used <b>Microprocessor</b> Several input devices were introduced. For example, Mouse, scanners, microphones, etc. Magnetic disk was used as primary external storage device Graphical user Interface (GUI) was developed	IBM personal computers, Apple Macintosh, HP 3000
Fifth Generation	1980–till date	Many new inventions such as laptops, tablets, smartphone, etc. New features include artificial intelligence, natural language processing, user friendly interface, voice command input	Desktop, Laptops, Notebook, Tablets, Supercomputers, etc.

## CLASSIFICATION OF COMPUTERS

### Based on Function

- **Digital computers:** They operate on inputs that are converted into binary digits (0 or 1). Most of the computers available today are digital computers.
- **Analog computers:** Process analog data, which is of continuous nature as input. Such data includes pressure, voltage, temperature, speed, etc. It measures continuous changes in specific physical quantity, e.g., Speed is measured by the speedometer of a car.
- **Hybrid computers:** Hybrid computers exhibit features of both digital and analog computers. They are highly accurate and very fast in speed. They take analog signals and convert them into digital.

### Based on Size and Capacity

- **Mainframe computers** (introduced in 1950s): They are used primarily by large organizations for critical applications (bulk data processing). They are known for their large size, amount of storage, processing power and high level of reliability.

- **Minicomputers** (introduced in 1960s): Much smaller than mainframe computers.

Used in computer-aided designing and small organizations.

- **Micro computers/personal computers** (introduced in the 1980s): Smaller in size and portable. They were single user systems for everyday activities like calculations, documentations, designing and presentations.
- **Supercomputers:** Most powerful and the largest computers. They are made for specific tasks such as defense system, weather forecasting, and complex scientific research.

## HARDWARE AND SOFTWARE

### Hardware

Hardware refers to the physical parts of the computer system. For example, CPU (central processing unit), Monitor, Keyboard, mouse, etc.

### Structure and Parts of Computer

The basic structure of computer comprises of input devices/units, central processing and output devices/units.



### KEY POINTS

- The physical component of the computer that anyone can touch is known as “hardware”.
- Silicon is the primary element in computer chips.
- A pixel is the smallest portion of the screen. Entire screen is made by putting millions of pixels together in a matrix form.
- Three color dots form a color pixel on a screen, and these are the following color dots: red, blue, and green.
- In fourth generation computer, data is stored on the floppy diskette in magnetism form.

**Table 2:** Parts of hardware devices

Parts	Devices
Input devices/unit	<ul style="list-style-type: none"> <li>• Mouse</li> <li>• Keyboard</li> <li>• Scanner</li> <li>• Microphone</li> <li>• Web/video camera</li> <li>• Joystick</li> <li>• Light pen</li> <li>• Trackball</li> <li>• Bar code reader</li> <li>• Touch screen</li> <li>• Graphic tablet</li> <li>• Magnetic ink character reader (MICR)</li> <li>• Optical Mark recognition (OMR)</li> </ul>



Contd...

“Sometimes the remedy is worse than the disease.”

—Francis Bacon



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### ARTIFICIAL INTELLIGENCE

1. Which of the following is a chatbot developed by Google AI?

- a. Chatbot
- b. Meena
- c. Xiaoice
- d. Bard

**New Q**

**Explanation:** Bard is a large language model chatbot developed by Google AI. Bard was launched on February 6, 2023. It is trained on a massive dataset of text and code, and is able to hold conversations that are both informative and engaging.

2. Which of the following is a chatbot developed by OpenAI?

- a. Xiaoice
- b. Bard
- c. ChatGPT
- d. LaMDA

**New Q**

**Explanation:** ChatGPT is a chatbot developed by OpenAI. It is trained on a massive dataset of text and code, and is able to hold conversations that are both informative and engaging.

Xiaoice is a chatbot developed by Microsoft Research China, Bard is a chatbot developed by Google AI, and LaMDA is a chatbot developed by Google AI.

3. Which of the following is NOT a potential benefit of Artificial Intelligence in nursing?

- a. Improved accuracy of diagnoses
- b. Increased efficiency of care delivery
- c. Personalized care
- d. Increased workload for nurses

**New Q**

4. All of the following are potential risks of AI in nursing; EXCEPT:

- a. AI could be used to make biased decisions about patients.
- b. AI could be used to replace nurses in the workforce.
- c. AI may increase the cost of care delivery
- d. AI could be hacked and used to harm patients.

**New Q**

**Explanation:** The potential risks of AI in nursing include the possibility of biased decision-making, the potential replacement of nurses in the workforce, and the risk of AI being hacked and used to harm patients. However, it is not directly associated with increasing the cost of care delivery. In fact, AI has the potential to streamline processes and improve efficiency, which could potentially reduce costs.

5. The following are the most important things for nurses; to prepare for the future of AI in nursing; except:

- a. Learn about the different applications of AI in nursing.
- b. Resist the introduction of AI as it is a potential threat to nursing workforce
- c. Be critical to the use of AI in nursing.
- d. Be open to the idea of using AI in their practice.

**New Q**

**Explanation:** Nurses should be proactive in preparing for the future of AI in nursing by learning about the different applications of AI, being critical of its use, and being open to the idea of using AI in their practice. Resisting the introduction of AI as a potential threat to the nursing workforce may hinder nurses' ability to adapt and embrace the potential benefits that AI can offer in improving patient care and outcomes.

6. Which of the following is NOT a potential benefit of using AI tools in nursing research?

- a. Increased efficiency of data collection and analysis
- b. Increased workload for researchers
- c. Improved accuracy of research findings
- d. Personalized research

**New Q**

**Explanation:** Increased workload for researchers is not a potential benefit of using AI tools in nursing research. AI can actually help to reduce the workload for researchers by automating tasks and providing support for data analysis.

7. Which of the following is a potential benefit of using AI in nursing research?

- a. Increased accuracy in data analysis
- b. Decreased need for human involvement
- c. Reduction in ethical considerations
- d. Limited applicability in complex research studies

**New Q**

**Explanation:** The use of AI in nursing research can provide increased accuracy in data analysis. AI algorithms can process large amounts of data quickly and efficiently, allowing for more precise analysis and identification of patterns or trends that may not be easily recognizable by human researchers.

8. How can AI be utilized in data analysis for nursing research?

- a. Identifying research participants
- b. Generating research hypotheses
- c. Analyzing large datasets for patterns and trends
- d. Conducting literature reviews

**New Q**

**Explanation:** AI can be utilized in data analysis for nursing research by analyzing large datasets for patterns and trends. This can help researchers uncover new insights, identify associations, and make predictions based on the data.

9. How can researchers best use AI tools to improve nursing research?

- a. By using AI to automate tasks and free up time for researchers to conduct more research.
- b. By using AI to help researchers to make better decisions about research design and analysis.
- c. By using AI to collect and analyze data to improve the quality of research findings.
- d. By using AI to make research findings more accessible to the public.

**New Q**

### Ans.

- 1. d
- 2. c
- 3. d
- 4. c
- 5. b
- 6. b
- 7. a
- 8. c
- 9. c

“One day in perfect health is much.”

—Arabic

CHAPTER

# 15



## FORENSIC NURSING AND INDIAN LAWS

### SYNOPSIS

#### INTRODUCTION

- Forensic nurses provide comprehensive care to individuals who have experienced violence, trauma, or are involved in legal proceedings.
- Forensic nurses work in various settings such as hospitals, clinics, correctional facilities, and forensic laboratories.
- Forensic nursing requires a unique set of skills, combining medical knowledge, evidence collection, and legal understanding.

#### IMPORTANCE

- Collection and preservation of evidence related to crimes, accidents, or abuse cases.
- To gather physical evidence, document injuries, and provide detailed reports for legal purposes. This can involve photographing injuries, collecting DNA samples, and maintaining chain of custody for evidence.
- To provide compassionate care to victims of violence or trauma, including sexual assault, domestic violence, child abuse, and elder abuse.
- To prepare thorough assessments, provide medical treatment, offer emotional support, and connect patients with appropriate resources for counseling and follow-up care.
- To collaborate with multidisciplinary teams, including law enforcement personnel, social workers, psychologists, and legal professionals.

#### AREAS OF FORENSIC NURSING PRACTICE

- Intimate partner violence
- Child abuse/maltreatment
- Elder abuse
- Sexual assault
- Death investigation
- Correctional nursing

#### SCOPE AND PRACTICE OF FORENSIC NURSING

- Forensic evidence collection
- Sexual assault nurse examiner
- Documentation and reporting of findings and observation
- Injury assessment and documentation
- Expert witness testimony
- Collaborative role
- Community education and advocacy

#### MILESTONES IN FORENSIC NURSING

- **1982:** The International Association of Forensic Nurses (IAFN) was established.
- **1995:** The American Nurses Association recognized forensic nursing as a nursing specialty.
- **2021:** Indian Nursing Council introduced forensic nursing as a subject in the graduate nursing program.



#### KEY POINTS

- Forensic nursing is a specialty within the nursing profession that focuses on the application of nursing knowledge to the legal system.
- Forensic nurses work in collaboration with law enforcement, legal professionals, and other healthcare providers.
- The history of forensic nursing can be traced back to the early 1900s, when nurses began to work in prisons and jails.
- In the 1960s, nurses began to work in the field of child abuse, and in the 1970s, nurses began to work in the field of sexual assault.
- The International Association of Forensic Nurses (IAFN) was established in 1982.
- In 2021, Indian Nursing Council introduced Forensic Nursing as a subject in their Under Graduate curriculum.

## SUBSPECIALTIES IN FORENSIC NURSING

**Table 1:** Subspecialties and their descriptions

Subspecialty	Description
Sexual assault nurse examiners (SANEs)	Providing comprehensive care to individuals who have experienced sexual assault or rape. They are trained in forensic evidence collection, conducting sensitive interviews, and providing medical and psychological support to survivors.
Forensic psychiatric nurses	Work with individuals involved in the legal system who have mental health issues. They assess and treat mental health conditions, provide counseling, and therapy, and assist in determining the mental competency of individuals involved in legal proceedings.
Forensic nurse death investigators	Nurses work closely with medical examiners or coroners to investigate deaths that are suspicious, violent, or unexpected. They assist in the collection of evidence, document injuries, and provide expert input on the medical aspects of death investigations.
Forensic nurse consultants	Provide expert advice and consultation on forensic nursing matters. They may assist with legal cases, review medical records, provide expert testimony, and offer guidance on policies and protocols related to forensic nursing practice.
Forensic nurse educators	They are responsible for teaching and training aspiring forensic nurses. They develop and deliver educational programs, design curriculum, and provide guidance on forensic nursing practice.
Forensic nurses in correctional settings	Nurses work within prisons, providing health care services to individuals who are incarcerated. They assess and treat injuries, conduct health screenings, address mental health concerns, and provide support for inmates within the criminal justice system.
Legal nurse consultants	They bridge the gap between health care and the legal system. They provide expertise and analysis on medical-legal cases, review medical records, assist with case preparation, and offer guidance on health care standards and regulations within legal contexts.

## ETHICAL ISSUES IN FORENSIC NURSING

**Table 2:** Ethical issues and their descriptions

Ethical issues	Description
Confidentiality and privacy	Forensic nurses often work with sensitive and confidential information related to victims, perpetrators, and legal cases. They must maintain strict confidentiality and privacy while balancing the need to share pertinent information with law enforcement and legal authorities to ensure public safety and facilitate justice.
Informed consent	Obtaining informed consent can be challenging in forensic nursing, especially in cases involving victims of violence or trauma. Forensic nurses must ensure individuals fully understand the purpose, risks, and benefits of any procedures or interventions, while taking into account their emotional and psychological state.
Autonomy and decision-making	Forensic nurses may encounter situations where individuals' autonomy and decision-making capacity are compromised due to trauma, mental health issues, or other factors. Balancing respect for autonomy with the duty to protect vulnerable individuals can be ethically complex.
Dual roles and conflicts of interest	Forensic nurses may face situations where they have dual roles or conflicting responsibilities. For example, they may be both a health care provider and a forensic expert witness. Managing potential conflicts of interest and ensuring objectivity and integrity is essential in such cases.



### KEY POINTS

The roles of the forensic nurse include:

- Collecting and analyzing evidence
- Providing care to victims of crime:
- Testifying in court



### KEY POINTS

- Forensic nurse death investigators are nurses who work closely with medical examiners or coroners to investigate deaths that are suspicious, violent, or unexpected.
- Forensic psychiatric nurses work with individuals involved in the legal system who have mental health issues.
- Sexual Assault Nurse Examiners (SANEs) provide comprehensive care to individuals who have experienced sexual assault or rape.
- Forensic nurses in correctional settings work within prisons and provide healthcare services to individuals who are incarcerated.



### KEY POINT

Obtaining informed consent can be challenging in forensic nursing, especially in cases involving victims of violence or trauma.



Contd...

**"To keep the body in good health is a duty... otherwise we shall not be able to keep our mind strong and clear."**  
—Buddha



# MULTIPLE CHOICE QUESTIONS

## (Including Explained and Practice Questions)

### INTRODUCTION TO FORENSIC NURSING

1. Indian Nursing Council introduced forensic nursing as a subject in the graduate nursing program in the year:
  - a. 2016
  - b. 2018
  - c. 2021
  - d. 2023
2. The International Association of Forensic Nurses (IAFN) was established in the year:
  - a. 1965
  - b. 1982
  - c. 1995
  - d. 2001
3. Which of the following statement regarding the responsibilities of a forensic nurse is incorrect?
  - a. "The forensic nurse only cares for dead patients."
  - b. "The forensic nurse provides expert testimony at court trial."
  - c. "Forensic nurse provides compassionate care to victims of violence or trauma"
  - d. "Forensic nurse gathers physical evidence, documents injuries, and provides detailed reports for legal purposes."

7. Which of the following forensic team members are primarily responsible for crisis intervention, safety planning, and connecting individuals with appropriate community services?
  - a. Medical examiners
  - b. Victim advocates
  - c. Forensic nurses
  - d. Social workers/Counselors
8. Which sub-specialty of forensic nursing involves working closely with medical examiners or coroners to investigate suspicious, violent, or unexpected deaths?
  - a. Legal Nurse Consultant
  - b. Forensic Psychiatric Nurse
  - c. Forensic Nurse Death Investigator
  - d. Forensic Nurse Consultant
9. Which forensic nurse is responsible for conducting screenings of sexual predators?
  - a. Legal nurse consultant
  - b. Forensic psychiatric nurse
  - c. Sexual assault nurse examiner
  - d. Forensic Nurse Death Investigator

### ETHICAL ISSUES IN FORENSIC NURSING

4. In forensic nursing, what ethical issue arises when balancing the need to maintain confidentiality and privacy with the obligation to share relevant information with law enforcement and legal authorities?
  - a. Informed Consent
  - b. Dual Roles and Conflicts of Interest
  - c. Confidentiality and Privacy
  - d. Cultural Sensitivity and Diversity
5. When providing care, what ethical challenge may arise in respecting beliefs and practices while ensuring the safety and well-being of individuals?
  - a. Safety and privacy
  - b. Duty to report
  - c. Cultural sensitivity and diversity
  - d. Autonomy and decision-making

**Explanation:** The role of the forensic psychiatric nurse involves conducting sexual predator screening. Sexual assault nurse examiners are responsible for gathering evidence from victim of sexual abuse. Legal nurse consultants are involved in investigating care delivery outcomes. Forensic nurse death investigator works closely with medical examiners or coroners to investigate suspicious, violent, or unexpected deaths.

10. The responsibilities of the legal nurse consultant (LNC) include all; except:
  - a. Representing patients in a court of law
  - b. Creating timelines of health care events
  - c. Organizing and analyzing medical records
  - d. Identifying when standards of care are met or breached
11. While testifying in court proceedings, the legal nurse consultant (LNC) should do all; except:
  - a. Respond confidently
  - b. Avoid becoming angry
  - c. Answer questions quickly
  - d. Refrain from saying "I believe"

**Explanation:** While testifying in court proceedings, It is important to take a brief moment to carefully formulate and provide an answer to a question, as responding too quickly increases the chances of misspeaking or providing inaccurate information. The LNC should respond confidently, avoid becoming angry, refrain from saying "I believe", and sit with hands resting on the lap.

### FORENSIC TEAM

6. Which member of the forensic team is responsible for conducting autopsies and determining the cause and manner of death in cases of suspicious or violent deaths?
  - a. Medical Examiners/Forensic Pathologists
  - b. Forensic Nurses
  - c. Forensic scientists
  - d. Psychologists/Psychiatrists



**Ans.**

1. c
2. b
3. a
4. c
5. c
6. a
7. d
8. c
9. b
10. a
11. c



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Section

**B**

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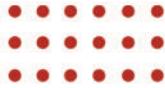
### PAPERS COVERED (IN BOOK)

1. NORCET (June) 2023 (Memory Based ) (NEW)
2. AIIMS Jodhpur (SNO) 2023 (NEW)
3. AIIMS Bibinagar (Tutor) 2023 (NEW)
4. AIIMS Bibinagar Associate Professor 2023 (NEW)
5. Sree Chitra Tirunal Institute for Medical Science and Technology (NO) 2023 (NEW)
6. Uttar Pradesh University of Medical Sciences (NO) 2023 (NEW)
7. NORCET (NO) 2022 (Memory Based) (NEW)
8. Staff Nurse Examination Himachal Pradesh 2022 (NEW)
9. Western Coalfields Limited 2022 (NEW)
10. Odisha Subordinate Staff Selection Commission (NO) 2022 (NEW)
11. Gujarat Nursing Service (Nursing Officer/Principal) 2022 (NEW)
12. NORCET (NO) 2021 (Memory Based) (NEW)
13. CNCI (NO) 2021
14. NORCET (NO) 2020
15. Combined AIIMS (NO) (Bhopal, Jodhpur, Patna & Raipur) 2020
16. AIIMS Nagpur (NO) 2020
17. AIIMS Patna (NO) 2020
18. Nursing Officer Exam, JIPMER 2020



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## PAPERS COVERED *(in Target High Digital Lite)*

1. NORCET (June) 2023 (Memory Based) (NEW)
2. AIIMS Jodhpur (SNO) 2023 (NEW)
3. AIIMS Bibinagar (Tutor) 2023 (NEW)
4. AIIMS Bibinagar Associate Professor 2023 (NEW)
5. Sree Chitra Tirunal Institute for Medical Science and Technology (NO) 2023 (NEW)
6. Uttar Pradesh University of Medical Sciences (NO) 2023 (NEW)
7. NORCET (NO) 2022 (Memory Based) (NEW)
8. Staff Nurse Examination Himachal Pradesh 2022 (NEW)
9. Western Coalfields Limited 2022 (NEW)
10. Odisha Subordinate Staff Selection Commission(NO) 2022 (NEW)
11. Gujarat Nursing Service 2022 (Nursing Officer/Principal) (NEW)
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13. Combined AIIMS (NO) (Bhopal, Jodhpur, Patna & Raipur) 2020
14. AIIMS Raipur (Lecturer) 2021
15. AIIMS NORCET 2020
16. AIIMS Nagpur (Nursing Officer) 2020
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18. AIIMS Raipur (Nursing Officer) 2019
19. AIIMS Bhatinda (Nursing Officer) 2019
20. AIIMS Raipur (Nursing Officer) 2019; Shift 1
21. AIIMS Raipur (Nursing Officer) 2019; Shift 2
22. AIIMS Raipur (Nursing Officer) 2019; Shift 3
23. AIIMS Bhubaneswar (Senior Nursing Officer) 2019
24. AIIMS New Delhi (Nursing Officer) 2019
25. AIIMS New Delhi (Nursing Officer) 2018
26. AIIMS Nagpur (Nursing Officer) 2018
27. AIIMS Jodhpur (Senior Nursing Officer) Grade I: 2018
28. AIIMS Bhopal (Senior Nursing Officer) 2018
29. AIIMS Bhopal (Nursing Officer) 2018; Shift 1
30. AIIMS Bhopal (Nursing Officer) 2018; Shift 2
31. AIIMS Mangalagiri (Nursing Officer) Grade-II; 2018; Shift 2
32. AIIMS Bhubaneswar (Nursing Officer) 2018
33. AIIMS Raipur (Nursing Officer) 2017; Shift 1
34. AIIMS Raipur (Nursing Officer) 2017; Shift 2
35. AIIMS Raipur (Nursing Officer) 2017; Shift 3
36. AIIMS Raipur (Nursing Tutor) 2017
37. AIIMS Jodhpur & Rishikesh (Nursing Officer) 2017
38. AIIMS Raipur (Senior Nursing Officer) 2017
39. AIIMS Bhopal (Nursing Officer) 2016
40. AIIMS New Delhi (Nursing Officer) 2016
41. AIIMS Bhopal (Senior Nursing Officer) 2016
42. CNCI (Nursing Officer) 2021
43. BFUHS 2021
44. ESIC Paramedical 2019; Shift 1
45. ESIC Paramedical 2019; Shift 2
46. ESIC (Nursing Officer) 2016; Shift 1
47. ESIC (Nursing Officer) 2016; Shift 2
48. ESIC (Nursing Officer) Bangalore Shift 1: 2016
49. ESIC (Nursing Officer) Bangalore Shift 2: 2016
50. ESIC (Nursing Officer) Delhi 2016
51. ESIC (Nursing Officer) Bangalore 2013
52. ESIC (Nursing Officer) Chennai 2012
53. ESIC (Nursing Officer) Grade II: 2011
54. ESIC (Nursing Officer) Ahmedabad 2011
55. Kerala PSC 2021
56. Kerala PSC (Nursing Officer) 2017
57. Kerala PSC (Nursing Officer) 2016
58. Kerala PSC (Nursing Officer) 2014
59. Kerala PSC (Nursing Officer) Grade II: 2011
60. Kerala PSC (Nursing Officer) Set C: 2011
61. Kerala PSC (Nursing Officer) 2010
62. BHU (Nursing Officer) 2019
63. BHU (Nursing Officer) 2018
64. BHU (Nursing Officer) 2016
65. BHU (Nursing Officer) 2015
66. Safdarjung (Nursing Officer) 2019
67. Safdarjung (Nursing Officer) 2018
68. JIPMER (Nursing Officer) 2020
69. JIPMER (Nursing Officer) 2013
70. JIPMER (Nursing Officer) 2012
71. UK State MSc (Nursing Officer) 2016
72. UK Nursing Tutor (Paper 1- Set B)
73. RRB (Nursing Officer) 2019; Shift 1
74. RRB (Nursing Officer) 2019; Shift 2
75. RRB (Nursing Officer) 2019; Shift 3
76. RRB (Nursing Officer) 2019; Shift 4
77. RRB (Nursing Officer) 2019; Shift 5
78. RRB Paramedical PHN 2015
79. RRB (Nursing Officer) 2015; Set A
80. RRB (Nursing Officer) 2015; Set B
81. RRB (Nursing Officer) 2015; Set C
82. RRB Secunderabad (Senior Nursing Officer) 2015
83. RRB (Nursing Officer) 2012
84. HPSSC (Nursing Officer) 2016
85. HP (Nursing Officer) 2016
86. RAK MSc Entrance Exam 2018
87. RAK New Delhi Entrance Exam 2017
88. GMCH (Nursing Officer) 2019
89. GMCH (Nursing Officer) 2016
91. Northern Coal Field Limited, Singrauli (Nursing Officer) 2019
92. PGIMER Chandigarh (Nursing Officer) 2016
93. CHO Haryana 2021
94. CHO Rajasthan 2020
95. CHO Madhya Pradesh 2020
96. CHO Madhya Pradesh 2019 Shift-1
97. CHO Uttar Pradesh 2018
98. RUHS MSc Nursing Entrance Exam 2018
99. RUHS MSc Nursing Entrance Exam 2016
100. RUHS Post Basic Basic Nursing Entrance Exam 2016
101. LNJP Hospital Delhi (Nursing Officer) 2012
102. DSSSB Shift I (NO) 2019
103. DSSSB Shift II (NO) 2019
104. DSSSB PHN 2015
105. DSSSB ANM 2015
106. Jhalawar Hospital and Medical College Society 2012
107. TNPSC Maternal and Child Health Officer 2015
108. RML Hospital (Nursing Officer) 2011
109. Insurance Medical Services (Nursing Officer) 2004
110. RRC (Nursing Officer) 2012
111. SCTIMST (Nursing Officer) 2015
112. Rohtak (Nursing Officer) 2020
113. NIMHANS (Nursing Officer) 2019 (Memory Based)
114. SKIM (Nursing Officer) 2020 Paper
115. Gujarat Staff (Nursing Officer) 2021
116. Jr. Grade Nurse/Jr. Staff Nurse/Jr. Nurse 2020
117. UPPSC Staff Nurse 2021
118. Uttarakhand Assistant Professor 2021
119. Daman & Diu (NO) 2018



**“Sometimes the remedy is worse than the disease.”**

—Francis Bacon



## NORCET (June) 2023 (Memory Based)

- Which oil is harmful for coronary artery disease?**
  - Coconut oil
  - Sunflower oil
  - Safflower oil
  - Olive oil
- When performing a cardiovascular assessment, the nurse notes that patient needs to sit upright to breathe. This behavior is most indicative of:**
  - Pericarditis
  - Anxiety
  - Congestive heart failure
  - Angina
- The child with iron poisoning is given IV deferoxamine mesylate (Desferal). Following administration, the child suffers hypotension, facial flushing, and urticaria. The initial nursing intervention would be to:**
  - Discontinue the IV
  - Stop the medication, and begin a normal saline infusion
  - Take all vital signs, and report to the physician
  - Assess urinary output, and if it is 30 mL an hour, maintain current treatment
- Which of the following is the classical CSF finding seen in Tuberculous meningitis?**
  - Increased protein, decreased sugar, increased lymphocytes
  - Increased protein, sugar and lymphocytes
  - Decreased protein, increased sugar and lymphocytes
  - Increased sugar, protein and neutrophils
- A patient is admitted in emergency with a suspected fracture of neck of femur. While assisting, the nurse will place the patient in which of the following position?**
  - External rotation less than 45°.
  - External rotation more than 45°.
  - Internal rotation less than 45°.
  - Internal rotation more than 45°.
- Patient develops type 2 respiratory failure. What could be the possible cause associated with it?**
  - Interstitial lung disease
  - Flail chest
  - Pulmonary edema
  - ARDS
- A client develops severe dyspnea after 100 meter of running. Using the mMRC Dyspnea scale, the client will be categorized into which grade to assess degree of baseline functional disability due to dyspnea?**
  - Grade 0
  - Grade 1
  - Grade 2
  - Grade 3
- You have to assess the blood sugar level of your patient by using glucometer. The appropriate nursing action from the following is:**
  - Do not clean the site with alcohol swab
  - Check blood glucose level twice to obtain accurate reading
  - Wipe the first drop of blood and use second to measure the reading
  - First prick the finger and then connect the glucometer strip into the device.
- Polyuria is the characteristic feature of all of the following; except:**
  - Diabetes mellitus
  - Diabetes insipidus
  - Glomerulonephritis
  - Chronic renal failure
- How much Energy (Kcal) is provided by 500 mL of 5% Dextrose?**
  - 50 Kcal
  - 100 Kcal
  - 150 Kcal
  - 200 Kcal
- Osmolarity of plasma in normal adult is:**
  - 260-270 mOsm/L
  - 320-330 mOsm/L
  - 280-290 mOsm/L
  - 300-310 mOsm/L
- What is the diagnostic test for enteric fever in 2nd week?**
  - Widal test
  - Blood culture
  - Stool test
  - Sputum test
- All of the following can be seen in dengue hemorrhagic fever; except:**
  - Fever
  - Thrombocytopenia
  - Leukocytosis
  - Increased hematocrit count
- While providing care to a 5-year-old child, the nurse noticed that the patient is experiencing seizures. Select the priority nursing intervention during seizure.**
  - Maintain the patient in lying position, flat surface: turn head to side during seizure activity, give IV midazolam in appropriate dose and begin infusion of IV anticonvulsant
  - Maintain the patient in supine position, give supplemental oxygen, and start IV midazolam in an appropriate dose
  - Maintain the patient in lying position, flat surface; turn head to side during seizure activity; loosen clothing from neck or chest and abdominal areas; suction as needed; supervise supplemental oxygen or bag ventilation
  - Maintain the patient in supine position, flat surface; turn head to side during seizure activity, provide supplemental oxygen and inform the doctor on duty
- The nurse finds out the Serum potassium level of his patient is 6.5 mEq/L. Which changes on a patient's electrocardiogram (ECG) reflect hyperkalemia?**
  - Tall peaked T waves
  - Narrow QRS complex
  - Tall P waves
  - Normal P-R interval
- Which of the following is used in the management of hyperkalemia?**
  - Insulin with glucose
  - Sodium bicarbonate
  - Potassium chloride
  - Magnesium sulfate
- Osler's nodes are the features of which of the following?**
  - Rheumatic endocarditis
  - Endocarditis
  - Osteoarthritis
  - Rheumatic heart disease



**Ans.**

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"One day in perfect health is much."

—Arabic



## AIIMS Jodhpur (SNO) 2023

- Following a road accident, a patient was admitted to the neurosurgery ICU due to a head injury. During the assessment, the patient opens his eyes to painful stimuli but not to verbal stimuli. He answers questions by making incomprehensible sounds and localizes the site of the painful stimulus. His GCS score will be:
  - 9
  - 8
  - 6
  - 7
- A short-term goal for a patient with Alzheimer's disease is:
  - Regained sensory perception and cognitive function
  - Increased self-esteem and improved self-concept
  - Improved problem solving in activities of daily living
  - Improved functioning in the least restrictive environment
- The primary fever in malaria corresponding to the development of the parasites in the red blood cells comprise all of the following; except:
  - Hot stage
  - Relapse stage
  - Sweating stage
  - Cold stage
- What is the function of mRNA?
  - Escorts amino acid to ribosome
  - Carries message for protein synthesis
  - Helps form the ribosomes
  - Bonds with new strand
- Second component (other than NST) in Modified Biophysical Profile is:
  - Fetal breathing movements
  - Amniotic fluid index
  - Fetal movements
  - Fetal tone
- What is the best position for a patient in anaphylactic shock?
  - Supine with legs elevated
  - High fowler's
  - Semi fowler's
  - Lateral recumbent
- The year 2023 has been declared as The International Year of:
  - Fruits
  - Cereals
  - Nuts
  - Millets
- Regarding the placement of leads when recording ECG all of the following are correct; except:
  - V4-7th intercostal space at the midclavicular line
  - V3-linear midpoint between V2 and V4
  - V2 4th intercostal space left margin of sternum
  - V1-4th intercostal space- right margin of sternum
- Low molecular weight heparin should be administered:
  - Intradermally
  - Intravenously
  - Subcutaneously
  - Intramuscularly
- Beta-thalassemia is an autosomal recessive disorder. It is characterized by reduced hemoglobin levels in the body and is also known as:
  - Aplastic anaemia
  - Sickle cell anemia
  - Cooley's anemia
  - Hemolytic anemia
- Epigenetic factors play an important role in schizophrenia. In genetically vulnerable people, environmental factors may increase the risk and trigger schizophrenia. Which of the following statements is true?
  - Social companionship increases the risk of schizophrenia
  - Living in poverty does not increase the risk of schizophrenia.
  - Childhood trauma such as poverty or abuse can trigger schizophrenia
  - People living in rural areas are more vulnerable
- Identify the contraceptive device shown in the given picture.
  - Female condom
  - Diaphragm
  - Vaginal sponge
  - Male condom
- A nurse posted in a paediatric cardiology unit noted that the assessment findings of an infant reveal a continuous machinery murmur on the auscultation of the heart and signs of heart failure. She identifies that the infant has which of the following congenital cardiac defects?
  - Atrial septal defect
  - Aortic stenosis
  - Ventricular septal defect
  - Patent ductus arteriosus
- At the central level, the Union Ministry of Health and Welfare is headed by a cabinet minister, a minister of state and a deputy health minister. These are political appointments and have a dual role to serve political as well as administrative responsibilities for health. One of the functions in the union list is:
  - To organize family welfare program through family welfare centers
  - International health relations and quarantine
  - Prevention of extension of communicable diseases from one unit to another
  - Regulation and development of medical, nursing and other allied health professions



Ans.

- a
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- c
- a
- d
- d

“After dinner rest a while; after supper walk a mile.”

—T. Cogan



## AIIMS, Bibinagar (Tutor) 2023

- The anatomical structure in foetal circulation that allows the entry of blood from the right atrium to the left atrium is:**
  - Umbilical artery
  - Foramen ovale
  - Ductus arteriosus
  - Ductus venosus
- The size of bacteria is usually expressed in terms of:**
  - Nanometers
  - Millimicrons
  - Angstroms
  - Micrometers
- The color code used in the IMNCI case management process for urgent referral is:**
  - Red
  - Pink
  - Green
  - Yellow
- The structure that prevents atrioventricular valves opening upward into the atria during the ventricular systole is \_\_\_\_\_.**
  - Papillary muscles
  - Chordae tendineae
  - Purkinje fibre
  - Intercalated discs
- Which of the following is NOT an essential function of a family?**
  - Transmission of caste system to next generation
  - Regulation of sexual reproduction
  - Teach children to socialize
  - Ensure economic stability
- A systematic inquiry into principles of right and wrong conduct is known as:**
  - Ethics
  - Values
  - Law
  - Justice
- \_\_\_\_\_ is the type of attention that facilitates an individual to change his focus and attention between two or more stimuli.**
  - Divided attention
  - Focused attention
  - Selective attention
  - Altering attention
- The type of placenta previa which is known as dangerous placenta previa is:**
  - Central placenta previa
  - Type II posterior placenta previa
  - Marginal placenta previa
  - Type II anterior placenta previa
- The type of joint found between the skull bones is:**
  - Cartilaginous joint
  - Synovial joint
  - Fibrous joint
  - Hinge joint
- What is the Intelligence Quotient (IQ) of an individual with the mental age of 30 and chronological age of 25?**
  - 100
  - 123
  - 83
  - 120
- The type of programmed instruction in which the learner moves from one frame to another until he completes the program and the responses are controlled by the programmer from a far place is:**
  - Intrinsic programming
  - Branching programming
  - Linear programming
  - Remediation
- The type of microscope that enables observation of living cells at extremely high magnification and resolution under physiological condition is:**
  - Scanning electron microscope
  - Atomic force microscope
  - Compound microscope
  - Transmission electron microscope
- The hammer-shaped bone of the middle ear which contacts with the tympanic membrane is:**
  - Malleus
  - Incus
  - Cochlea
  - Stapes
- Which of the following is NOT a principal component of the integrated practice model of forensic nursing science?**
  - Clarification of roles
  - Role identification
  - Role expectations
  - Role behavior
- General intelligence theory was described by:**
  - Louis Thurstone
  - Charles Spearman
  - Jerome Bruner
  - Howard Gardner
- Which of the following is a rich dietary source of Vitamin D?**
  - Broccoli
  - Oily fish
  - Squid
  - Octopus
- The route of administration in which the drug is rubbed into the skin to get absorbed to produce a systemic effect is:**
  - Inunction
  - Dermojet
  - Iontophoresis
  - Topical application
- Which of the following etiological factors is associated with post-mature babies?**
  - Maternal uterine anomalies
  - Foetal adrenal hyperplasia
  - Anencephaly
  - Maternal low socio-economic status
- The side effect caused by all statins is:**
  - Stroke
  - Hypersomnia
  - Myocardial infarction
  - Muscle tenderness
- Which of the following is a plasma-derived chemical mediator of acute inflammation?**
  - Histamine
  - Prostaglandins
  - Cytokines
  - Kinins
- The factor that delays wound healing is:**
  - Young age
  - Neutrophilia
  - Increased zinc intake
  - Movement of affected area
- Which of the following is a cause for orthostatic hypotension?**
  - Lack of fluid intake
  - Peripheral vasoconstriction
  - Fluid loss
  - Peripheral vasodilatation
- Immunization against which of the following maternal infections is a primary prevention measure for mental retardation?**
  - Mums
  - Rubella
  - Tetanus
  - Measles



Ans.

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**"Sometimes the remedy is worse than the disease."**

—Francis Bacon



## AIIMS, Bibinagar Associate Professor 2023

- Which of the following is a common disorder for a child with Cushing syndrome?
  - Respiratory acidosis
  - Metabolic alkalosis
  - Metabolic acidosis
  - Respiratory alkalosis
- All of the following statements are true about SIADH lab values; except:
  - SIADH cause increased urine osmolarity
  - SIADH cause elevated urine sodium concentration
  - SIADH cause decreased plasma osmolarity
  - SIADH cause increased plasma osmolarity
- What is the diagnosis code of dual-role transvestism in ICD-10?
  - F 64.3
  - F 64.2
  - F 64.0
  - F 64.1
- Self-care deficit theory was developed by:
  - Betty Neuman
  - Florence Nightingale
  - Virginia Henderson
  - Dorothea Elizabeth Orem
- Maternal administration of magnesium sulfate for longer than 5-7 days during pregnancy leads to:
  - Fetal hypocalcemia
  - Fetal hypokalemia
  - Maternal hypertension
  - Maternal seizures
- Which of the following is an important role of a nurse in milieu therapy?
  - Helps in attitude therapy
  - Helps in assisting ECT or other brain stimulation therapy
  - Helps to manage the environment
  - Helps in assisting Eye Movement Desensitization and Reprocessing (EMDR) therapy
- Intracranial herniation that occurs when brain tissue is displaced under the falx cerebri is called:
  - Uncal herniation
  - Subfalcine herniation
  - Disk herniation
  - Inguinal herniation
- Which of the following is a FALSE statement regarding Ayushman Bharat?
  - Only two members in a family are eligible for this scheme
  - It is the world's largest health insurance/assurance scheme fully financed by the government
  - It provides a cover of ₹5 lakh per family per year for secondary and tertiary care hospitalization across public and private empanelled hospitals in India
  - It covers up to 3 days of prehospitalization and 15 days posthospitalisation expenses such as diagnostics and medicines
- Which of the following tests is used to detect deep vein thrombosis?
  - D-dimer tests
  - Immunosorbent assay
  - ELISA test
  - WIDAL test
- Arteriovenous malformation causes pain, bleeding or ulcers in which stage of Schöbinger staging system?
  - Stage I (quiescence)
  - Stage III (destruction)
  - Stage II (expansion)
  - Stage IV (decompensation)
- Which of the following is the main cause of hypercalcemia?
  - Decreased parathyroid hormone (PTH)
  - Decreased antidiuretic hormone (ADH)
  - Increased antidiuretic hormone (ADH)
  - Increased parathyroid hormone (PTH)
- A planned learning experience provided by employing an agency for the improvement of employees is known as:
  - Career planning
  - Democratic management
  - In-service education
  - Job description
- Which type of leadership style is the least intrusive and ensures that the decision-making authority lies with the team members?
  - Democratic leadership
  - Strategic leadership
  - Autocratic leadership
  - Laissez-faire leadership
- Ankylosing spondylitis leads to:
  - Inflammation of the spine
  - Inflammation of the sacrum
  - Inflammation of the coccyx
  - Inflammation of the xiphisternum
- Ms. Pavithra, a full term primigravida mother with labor pain got admitted for safe confinement. On PV examination it was revealed that small part of the head was below the brim of the pelvis and could be lifted out of the pelvis with a deep pelvic grip. What was the descent and engagement of the fetal head?
  - 3/5
  - 4/5
  - 2/5
  - 1/5
- Which of the following is NOT a cause of Systemic Lupus Erythematosus (SLE)?
  - Vitamin deficiency
  - Immunological factor
  - Environmental factor
  - Genetic factor
- Which of the following is a multi-dimensional pain assessment tool with three main components as sensory intensity, the cognitive evaluation of pain and the emotional impact of pain?
  - Visual Analogue Scale (VAS)
  - McGill Pain Questionnaire (MPQ)
  - FLACC scale
  - Numeric Rating Scale (NRS)
- All of the following are the advantages of a Gantt chart; except:
  - Helps to unsplit the activities by status of the task
  - Helps to schedule the tasks with start date and end date
  - Helps to understand the percentage of work or tasks remaining
  - Helps to understand the percentage of task completion



**Ans.**

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**"Sometimes the remedy is worse than the disease."**

—Francis Bacon



## NORCET (NO) 2022 (Memory Based)

- Which of the following is not included in the National Vector Borne Disease Control Program?
  - Malaria
  - Dengue
  - Plague
  - Filariasis
- All of the following vaccines are given IM; except:
  - Hep B
  - DPT
  - PCV
  - MMR
- Which of the following vaccines is most freeze sensitive vaccine?
  - MMR
  - DPT
  - Hep B
  - TT
- Which of the following muscles is the site for DPT vaccination?
  - Ventrogluteal
  - Vastus lateralis
  - Deltoid
  - Dorsogluteal
- Iron and folic acid dose for pregnant women:
  - 60 mg iron, 0.4 mg folic acid
  - 30 mg iron, 0.4 mg folic acid
  - 100 mg iron, 0.3 mg folic acid
  - 60 mg iron, 500 mcg folic acid
- Night blindness is due to the deficiency of:
  - Vitamin A
  - Vitamin C
  - Vitamin D
  - Vitamin B<sub>12</sub>
- Which of the following vaccines is kept in freezer compartment of the refrigerator?
  - Measles
  - DPT
  - Hep B
  - OPV
- Screening of depression at community level is an example of:
  - Secondary prevention
  - Primary prevention
  - Rehabilitation
  - Tertiary prevention
- A study was done to identify the number of typhoid cases due to exposure from a common well in the village groups formed of carriers and diseased people. What type of study design is represented here?
  - Cohort study
  - Cross-sectional study
  - Case-control study
  - Field trial
- Wernicke's and Korsakoff in alcoholic patient occur due to the deficiency of:
  - Thiamine deficiency
  - Vitamin C
  - Vitamin D
  - Vitamin A
- Sciatic nerve damage occurs due to IM injection given at which of the following muscles?
  - Dorsogluteal
  - Vastus lateralis
  - Ventrogluteal
  - Deltoid
- According to WHO, hypothermia in newborn is defined below:
  - 36.5°C
  - 37°C
  - 36.9°C
  - 37.2°C
- Primary prevention strategy for cervical cancer is:
  - HPV vaccine
  - Medications
  - Health education
  - Screening for cervical cancer
- Rickets in children is caused by:
  - Vitamin D deficiency
  - Vitamin C
  - Vitamin A
  - Vitamin B<sub>12</sub>
- The disease caused by the rat flea is:
  - Murine typhus
  - Epidemic typhus
  - Japanese encephalitis
  - Chagas disease
- During child CPR, chest compressions should be given at:
  - Upper half of sternum
  - Xiphisternum
  - Lower half of sternum
  - Below sternum
- A client undergoes mastoidectomy. When the client returns to the unit postoperatively, the client has difficulty drinking without drooling. It is most important for the nurse to take which action?
  - Re-assure patient as this is a normal finding
  - Assess patient's ability to whistle
  - Notify the physician.
  - Suction the secretions
- Which of the following is helpful in prevention of pre-eclampsia?
  - Ascorbic acid
  - Vitamin E
  - Calcium
  - Vitamin A
- All among the following are the emergency contraceptives; except:
  - Danazol
  - Levonorgestrel
  - Cu T
  - Mifepristone
- Skin of a patient with Addison's disease appears:
  - Yellow
  - Bronze
  - Black
  - Gray
- A pregnant woman at 38 weeks came to clinic and the period of gestation has been confirmed by the ultrasound reports and LMP. She has been started on oxytocin for induction of labor and the nurse notes that the contractions are coming for longer than 70 seconds and she is 3 cm dilated. What should the nurse do next?
  - Stop the oxytocin infusion
  - Increase the flow rate
  - Set the drops per minute
  - Document the findings
- Severely dehydrated child exhibits:
  - Sunken eyes
  - Skin goes back very slowly (in more than 2 seconds)
  - Eagerly drinks water
  - Irritable



**Ans.**

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“After dinner rest a while; after supper walk a mile.”

—T. Cogan



## NORCET (NO) 2021 (Memory Based)

1. Which of the following color code is not included in triage?

- a. Black
- b. Blue
- c. Green
- d. Red

2. The side effect of chloramphenicol drug is:

- a. Bone marrow suppression
- b. Epilepsy
- c. Osteoporosis
- d. Weight gain

3. Normal respiration in adults is:

- a. 10 beats/min
- b. 14 beats/min
- c. 30 beats/min
- d. 8 beats/min

4. The full form of DPT is:

- a. Dengue, pertussis, tetanus
- b. Diphtheria, pneumonia, tetanus
- c. Diphtheria, pertussis, tetanus
- d. Diphtheria, pertussis, typhoid

5. What is the dose of iron and folic acid in the Anemia Mukh Bharat Scheme?

- a. 50 mg and 500 mcg
- b. 60 mg and 500 mcg
- c. 50 mg and 400 mcg
- d. 40 mg and 500 mcg

6. What is baking powder?

- a. Sodium chloride
- b. Sodium bicarbonate
- c. Potassium bicarbonate
- d. Potassium chloride

7. The most common type of episiotomy is:

- a. Right mediolateral
- b. J shaped
- c. Lateral
- d. Median

8. Which of the following blood group is a universal donor?

- a. O positive
- b. O negative
- c. AB positive
- d. AB negative

9. A harsh, vibratory sound that occurs due to the narrowing of the upper airway, heard most prominently when inhaling is known as:

- a. Stridor
- b. Wheezing
- c. Rhonchi
- d. Snoring

10. Rapid and weak pulse is known as:

- a. Bounding pulse
- b. Thready pulse
- c. Strong pulse
- d. None of these

11. Chances of PTSD are most common in:

- a. Divorce
- b. Diagnosis of cancer
- c. Facing gunshot (means someone puts the gun on skull)
- d. Bank robbery

12. Projective technique is used for the assessment of:

- a. Memory
- b. Intelligence
- c. Knowledge
- d. Personality

13. What differentiates mania from hypomania?

- a. Psychotic symptoms
- b. Reduced sleeping time
- c. Effect on work
- d. Need for hospital admission

14. Which screening test is not used for cervical cancer?

- a. Colposcopy
- b. HPV DNA
- c. Pap smear
- d. VIA

15. Mr X does not use a car while going out, scared of using lifts. He avoids going in public places and keeps the doors open while in a closed room. He finds it uncomfortable to leave the house alone, so he always takes a family member along whenever he goes out. What will be the probable diagnosis?

- a. Claustrophobia
- b. Agoraphobia
- c. Public phobia
- d. Aerophobia

16. Which vaccine is not included in Indradhanush Program?

- a. DPT
- b. Hepatitis B
- c. Pneumococcal vaccine
- d. Measles

17. Which of the following is the longest bone of the body?

- a. Femur
- b. Tibia
- c. Fibula
- d. Radius

18. Which of the following is the “Breast bone” in the following bones?

- a. Sternum
- b. Ribs
- c. Clavicle
- d. Vertebrae

19. Which among the following is most common in patient with schizophrenia.

- a. Thought broadcasting
- b. Visual hallucinations
- c. Thought block
- d. Delusion of persecution

20. A person is saying his family members are dying. He is also decaying, nothing exists in the world. What could be the probable diagnosis?

- a. Delusion of persecution
- b. Paranoid delusion
- c. Nihilistic delusion
- d. Delusion of reference

21. In which color bag placenta is discarded?

- a. Red
- b. Yellow
- c. Blue
- d. Black

22. Which measure is used for growth monitoring at Anganwadi center?

- a. Weight for height
- b. MUAC
- c. Skin fold thicknesses
- d. Weight for age

23. Which of the following is not a sign of good attachment?

- a. Upper side areola more exposed than lower
- b. Widely open mouth
- c. Chin touches the breast
- d. Lower lip move inward

24. What is the range of MUAC for malnutrition?

- a. <12.5 cm
- b. <11.5 cm
- c. <13.5 cm
- d. <14.5 cm

25. A cotton ball infected with pus is discarded in which colored bin?

- a. Yellow
- b. Black
- c. Red
- d. Blue

Ans.

- 1. b
- 2. a
- 3. b
- 4. c
- 5. b
- 6. b
- 7. a
- 8. b
- 9. a
- 10. b
- 11. c
- 12. d
- 13. d
- 14. d
- 15. a
- 16. c
- 17. a
- 18. a
- 19. d
- 20. c
- 21. b
- 22. d
- 23. a
- 24. a
- 25. a



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Section

A



## WHAT ALL YOU WILL GET IN TARGET HIGH DIGITAL LITE

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## 8 AMAZING FEATURES OF TARGET HIGH DIGITAL LITE

- **GOLDEN POINTS** Listen & Recall: 3000+ Golden Points in Podcast Format covering all Subjects.
- **ASSESS YOURSELF** Read and Practice: 80+ Subject-wise tests covering 7500+ Qs of all Subjects, and 48 Grand Tests covering 4800 Qs focusing NORCET 6.0 and 7.0.
- **HIGH YIELD TOPICS** Revise on the Go: 300+ High Yield Topics (Tables + Images) for quick access.
- **ADD Ons** Dil Mange More Content: 115+ Previous Year Papers (20 Papers with their Rationale and 90+ without Rationale), 75+ Appendices, Monthly Current Affairs, Recent Updates, 20 Nursing Skill Procedures, How to Prepare for Staff Competitive Exams, How to Appear in the Interview for Nursing Tutor, and Study Planner for AIIMS NORCET Exams with Tips and Tricks, Decoding the Case Scenario-Based Questions, How to Prepare for NORCET Stage I-Prelims and NORCET Stage II-Mains: An overview and plenty of ADD-ON content.
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  - Parts and Diameter of fetal skull
  - Body planes & movement
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## 1 GOLDEN POINTS

3000+ Golden Points with Voice-Over (Pre-loaded & Forthcoming)

S. No.	Subjects	No's	
1.	Fundamentals of Nursing	100	
2.	Medical Surgical Nursing/Adult Health Nursing	660	
3.	Pharmacology	172	
4.	Community Health Nursing	124	
5.	Psychiatric Nursing	252	
6.	Pediatric Nursing	121	
7.	Obstetric and Gynecological Nursing	277	
8.	Applied Microbiology	71	
9.	Applied Biochemistry and Nutrition	118	
10.	Applied Sociology and Psychology	78	
11.	Nursing Research and Statistics	35	
12.	Nursing Education	26	
13.	Nursing Administration and Management	28	
14.	Computer/Health and Nursing Informatics	52	
15.	Forensic Nursing and Indian Laws	36	
16.	Arithmetic and Numerical Ability	350	
17.	Forthcoming Golden Points Based on NORCET 2023 & NORCET 2024	500	Tentative
		3000	

## 2 ASSESS YOURSELF

8000+ Subject wise MCQs in 90+ Tests (Pre-loaded -7000 MCQs) & 200+ Newly added Exclusive in App + 700 Qs will be covered in Future Updates

S. No.	Subject	Total Qs [Pre-loaded (Book + App)]	Total sets of Test (Based on NORCET)	Newly added (Exclusive in App)
1.	Fundamentals of Nursing	820	10	35
2.	Medical Surgical Nursing/Adult Health Nursing	1060	12	100
3.	Pharmacology	620	8	20
4.	Community Health Nursing	840	10	–
5.	Psychiatric Nursing	820	10	–
6.	Pediatric Nursing	840	10	–
7.	Obstetric and Gynecological Nursing	820	10	20
8.	Applied Microbiology	170	4	–
9.	Applied Biochemistry and Nutrition	200	3	10
10.	Applied Sociology and Psychology	–	–	5
11.	Nursing Research and Statistics	320	5	10
12.	Nursing Education	100	2	–
13.	Nursing Administration and Management	200	2	15

Contd...



S. No.	Subject	Total Qs [Pre-loaded (Book + App)]	Total sets of Test (Based on NORCET)	Newly added (Exclusive in App)
14.	Computer/Health and Nursing Informatics	100	2	–
15.	Forensic Nursing and Indian Laws	–	–	10
16.	GK/English/Aptitude/Arithmetic and Numerical Ability	140	3	–
17.	New MCQs in Future Updates	725	–	–
	<b>Total Qs</b>	8000	91	–

48 Grand Tests (Prelims/Mains) Based on New Exam Pattern covering 4800 Qs based on Target High 7/e Edition for Practice

Grand Tests				
Test No	Date	Test Type	No. of Sets	No. of Qs
1.	20 <sup>th</sup> September 2023	NORCET Mains	1	100
2.	30 <sup>th</sup> September 2023	NORCET Mains	1	100
3.	15 <sup>th</sup> October 2023	NORCET Prelims	1	100
4.	30 <sup>th</sup> October 2023	NORCET Mains	1	100
5.	15 <sup>th</sup> November 2023	NORCET Prelims	1	100
6.	30 <sup>th</sup> November 2023	NORCET Mains	1	100
7.	15 <sup>th</sup> December 2023	NORCET Prelims	1	100
8.	30 <sup>th</sup> December 2023	NORCET Mains	1	100
9.	15 <sup>th</sup> January 2024	NORCET Prelims	1	100
10.	30 <sup>th</sup> January 2024	NORCET Mains	1	100
11.	15 <sup>th</sup> February 2024	NORCET Prelims	1	100
12.	30 <sup>th</sup> February 2024	NORCET Mains	1	100
13.	15 <sup>th</sup> March 2024	NORCET Prelims	1	100
14.	30 <sup>th</sup> March 2024	NORCET Mains	1	100
15.	15 <sup>th</sup> April 2024	NORCET Prelims	1	100
16.	30 <sup>th</sup> April 2024	NORCET Mains	1	100
17.	15 <sup>th</sup> May 2024	NORCET Prelims	1	100
18.	30 <sup>th</sup> May 2024	NORCET Mains	1	100
19.	15 <sup>th</sup> June 2024	NORCET Prelims	1	100
20.	30 <sup>th</sup> June 2024	NORCET Mains	1	100
21.	15 <sup>th</sup> July 2024	NORCET Prelims	1	100
22.	30 <sup>th</sup> July 2024	NORCET Mains	1	100
23.	15 <sup>th</sup> August 2024	NORCET Prelims	1	100
24.	30 <sup>th</sup> August 2024	NORCET Mains	1	100
25.	15 <sup>th</sup> September 2024	NORCET Prelims	1	100
26.	30 <sup>th</sup> September 2024	NORCET Mains	1	100
27.	15 <sup>th</sup> October 2024	NORCET Prelims	1	100
28.	30 <sup>th</sup> October 2024	NORCET Mains	1	100
29.	15 <sup>th</sup> November 2024	NORCET Prelims	1	100
30.	30 <sup>th</sup> November 2024	NORCET Mains	1	100
31.	15 <sup>th</sup> December 2024	NORCET Prelims	1	100

Contd...



Grand Tests				
Test No	Date	Test Type	No. of Sets	No. of Qs
32.	30 <sup>th</sup> December 2024	NORCET Mains	1	100
33.	15 <sup>th</sup> January 2025	NORCET Prelims	1	100
34.	30 <sup>th</sup> January 2025	NORCET Mains	1	100
35.	15 <sup>th</sup> February 2025	NORCET Prelims	1	100
36.	30 <sup>th</sup> February 2025	NORCET Mains	1	100
37.	15 <sup>th</sup> March 2025	NORCET Prelims	1	100
38.	30 <sup>th</sup> March 2025	NORCET Mains	1	100
39.	15 <sup>th</sup> April 2025	NORCET Prelims	1	100
40.	30 <sup>th</sup> April 2025	NORCET Mains	1	100
41.	15 <sup>th</sup> May 2025	NORCET Prelims	1	100
42.	30 <sup>th</sup> May 2025	NORCET Mains	1	100
43.	15 <sup>th</sup> June 2025	NORCET Prelims	1	100
44.	30 <sup>th</sup> June 2025	NORCET Mains	1	100
45.	15 <sup>th</sup> July 2025	NORCET Prelims	1	100
46.	30 <sup>th</sup> July 2025	NORCET Mains	1	100
47.	15 <sup>th</sup> August 2025	NORCET Prelims	1	100
48.	30 <sup>th</sup> August 2025	NORCET Mains	1	100

The test type is based on the current and future NORCET exam pattern. In future, if the exam pattern changes then accordingly the Grand Test pattern will also be changed without any prior information.

20 Special Tests (NORCET pattern) covering 200 Qs each – Total Qs 4000

Special Test			
Set No.	Test	Topic	No. of Qs
Set 1	TH Special Test-1	Pattern of NORCET 2023 (June)	200
Set 2	TH Special Test-2	Pattern of NORCET 2023 (June)	200
Set 3	TH Special Test-3	Pattern of NORCET 2023 (June)	200
Set 4	TH Special Test-4	Pattern of NORCET 2023 (June)	200
Set 5	TH Special Test-5	Pattern of NORCET 2023 (June)	200
Set 6	TH Special Test-6	Pattern of NORCET 2023 (June)	200
Set 7	TH Special Test-7	Pattern of NORCET 2023 (June)	200
Set 8	TH Special Test-8	Pattern of NORCET 2023 (June)	200
Set 9	TH Special Test-9	Pattern of NORCET 2023 (June)	200
Set 10	TH Special Test-10	Pattern of NORCET 2023 (June)	200
Set 11	TH Special Test-11	Pattern of NORCET 2023 (June)	200
Set 12	TH Special Test-12	Pattern of NORCET 2023 (June)	200
Set 13	TH Special Test-13	Pattern of NORCET 2023 (June)	200
Set 14	TH Special Test-14	Pattern of NORCET 2023 (June)	200
Set 15	TH Special Test-15	Pattern of NORCET 2023 (June)	200
Set 16	TH Special Test-16	Pattern of NORCET 2023 (June)	200
Set 17	TH Special Test-17	Pattern of NORCET 2023 (June)	200
Set 18	TH Special Test-18	Pattern of NORCET 2023 (June)	200
Set 19	TH Special Test-19	Pattern of NORCET 2023 (June)	200
Set 20	TH Special Test-20	Pattern of NORCET 2023 (June)	200

All the TH Special tests are based on the Pattern of NORCET 2023 (June) with National Level Ranking



### 3 HIGH YIELD TOPICS

300+ High Yield Tables & Images covered with detailed description (Pre-loaded & Forthcoming)

S. No.	Subject	Total Quantity	Tables	Images
1.	Fundamentals of Nursing	24	12	12
2.	Medical Surgical Nursing/Adult Health Nursing	34	8	26
3.	Pharmacology	13	13	–
4.	Community Health Nursing	24	13	11
5.	Psychiatric Nursing	21	17	4
6.	Pediatric Nursing	18	9	9
7.	Obstetric and Gynecological Nursing	30	8	22
8.	Applied Microbiology	6	5	1
9.	Applied Biochemistry and Nutrition	7	5	2
10.	Nursing Research and Statistics	10	3	7
11.	Nursing Education	9	6	3
12.	Nursing Administration and Management	2	1	1
13.	Computer/Health and Nursing Informatics	5	5	–
14.	Newly added in various subjects (Forthcoming-Forensic Nursing and Indian Laws, Applied Sociology and Psychology, etc.)	100	–	–
	<b>Total Tables &amp; Images</b>	303		

### 4 PREVIOUS YEAR PAPERS

115+ Previous Year Papers of National & State level exams, covering 2023–2004 (Selected Papers are with Rationale)

#### New (Previous Year Papers)

1.	NORCET 2023
2.	AIIMS Jodhpur (Senior Nursing Officer) 2023
3.	AIIMS Bibinagar (Tutor) 2023
4.	AIIMS Bibinagar Associate Professor 2023
5.	Sree Chitra Tirunal Institute for Medical Science and Technology (Nursing Officer) 2023
6.	Uttar Pradesh University of Medical Sciences (Nursing Officer) 2023
7.	NORCET (Nursing Officer) 2022 (Memory-based)
8.	Staff Nurse Examination Himachal Pradesh (October 2022)
9.	Western Coalfields Limited 2022
10.	Odisha Sub-Ordinate Staff Selection Commission 2022
11.	Nursing Officer/Principal, Gujarat Nursing Service 2022
12.	NORCET (Nursing Officer) 2021 (Memory-based)

#### Pre-loaded

Papers in Nursing Next Live App (Under Target High Digital Lite)

1.	AIIMS NORCET 2022 Recall (Shift 1)	5.	AIIMS NORCET 2020 (with rationale)
2.	AIIMS NORCET 2021 (Shift 1) Recall (with rationale)	6.	AIIMS Jodhpur (Nursing Officer) 2020 (with rationale)
3.	AIIMS NORCET 2021 (Shift 2) Recall (with rationale)	7.	AIIMS Nagpur (Nursing Officer) 2020
4.	AIIMS Raipur (Lecturer) 2021	8.	AIIMS Patna (Nursing Officer) 2020

Contd...

Contd...



9.	AIIMS Raipur (Nursing Officer) 2019	54.	BHU (Nursing Officer) 2018
10.	AIIMS Bathinda (Nursing Officer) 2019	55.	BHU (Nursing Officer) 2016
11.	AIIMS Raipur (Nursing Officer) 2019; Shift 1	56.	BHU (Nursing Officer) 2015
12.	AIIMS Raipur (Nursing Officer) 2019; Shift 2	57.	Safdarjung (Nursing Officer) 2019
13.	AIIMS Raipur (Nursing Officer) 2019; Shift 3	58.	Safdarjung (Nursing Officer) 2018
14.	AIIMS Bhubaneswar (Senior Nursing Officer) 2019	59.	JIPMER (Nursing Officer) 2020
15.	AIIMS New Delhi (Nursing Officer) 2019	60.	JIPMER (Nursing Officer) 2013
16.	AIIMS New Delhi (Nursing Officer) 2018	61.	JIPMER (Nursing Officer) 2012
17.	AIIMS Nagpur (Nursing Officer) 2018	62.	UK State MSc (Nursing Officer) 2016
18.	AIIMS Jodhpur (Senior Nursing Officer) Grade 1: 2018	63.	UK Nursing Tutor (Paper 1- Set B)
19.	AIIMS Bhopal (Senior Nursing Officer) 2018	64.	RRB (Nursing Officer) 2019; Shift 1 (with rationale)
20.	AIIMS Bhopal (Nursing Officer) 2018; Shift 1	65.	RRB (Nursing Officer) 2019; Shift 2
21.	AIIMS Bhopal (Nursing Officer) 2018; Shift 2	66.	RRB (Nursing Officer) 2019; Shift 3
22.	AIIMS Mangalagiri (Nursing Officer) Grade-II; 2018; Shift 2	67.	RRB (Nursing Officer) 2019; Shift 4
23.	AIIMS Bhubaneswar (Nursing Officer) 2018	68.	RRB (Nursing Officer) 2019; Shift 5
24.	AIIMS Raipur (Nursing Officer) 2017; Shift 1	69.	RRB Paramedical PHN 2015
25.	AIIMS Raipur (Nursing Officer) 2017; Shift 2	70.	RRB (Nursing Officer) 2015; Set A
26.	AIIMS Raipur (Nursing Officer) 2017; Shift 3	71.	RRB (Nursing Officer) 2015; Set B
27.	AIIMS Raipur (Nursing Tutor) 2017	72.	RRB (Nursing Officer) 2015; Set C
28.	AIIMS Jodhpur & Rishikesh (Nursing Officer) 2017	73.	RRB Secunderabad (Senior Nursing Officer) 2015
29.	AIIMS Raipur (Senior Nursing Officer) 2017	74.	RRB (Nursing Officer) 2012
30.	AIIMS Bhopal (Nursing Officer) 2016	75.	HPSSC (Nursing Officer) 2016
31.	AIIMS New Delhi (Nursing Officer) 2016	76.	HP (Nursing Officer) 2016
32.	AIIMS Bhopal (Senior Nursing Officer) 2016	77.	RAK MSc Entrance Exam 2018
33.	CNCI (Nursing Officer) 2021	78.	RAK New Delhi Entrance Exam 2017
34.	BFUHS 2021	79.	GMCH (Nursing Officer) 2019
35.	ESIC Paramedical 2019; Shift 1	80.	GMCH (Nursing Officer) 2016
36.	ESIC Paramedical 2019; Shift 2	81.	Daman and Diu (Nursing Officer) 2018
37.	ESIC (Nursing Officer) 2016; Shift 1	82.	Northern Coal Field Limited, Singrauli (Nursing Officer) 2019
38.	ESIC (Nursing Officer) 2016; Shift 2	83.	PGIMER Chandigarh (Nursing Officer) 2016
39.	ESIC (Nursing Officer) Bangalore Shift 1: 2016	84.	CHO Haryana 2021
40.	ESIC (Nursing Officer) Bangalore Shift 2: 2016	85.	CHO Rajasthan 2020
41.	ESIC (Nursing Officer) Delhi 2016	86.	CHO Madhya Pradesh 2020
42.	ESIC (Nursing Officer) Bangalore 2013	87.	CHO Madhya Pradesh 2019 Shift-1
43.	ESIC (Nursing Officer) Chennai 2012	88.	CHO Uttar Pradesh 2018
44.	ESIC (Nursing Officer) Grade II: 20	89.	RUHS MSc Nursing Entrance Exam 2018
45.	ESIC (Nursing Officer) Ahmedabad 2011	90.	RUHS MSc Nursing Entrance Exam 2016
46.	Kerala PSC 2021 (with rationale)	91.	RUHS Post Basic Nursing Entrance Exam 2016
47.	Kerala PSC (Nursing Officer) 2017	92.	LNJP Hospital Delhi (Nursing Officer) 2012
48.	Kerala PSC (Nursing Officer) 2016	93.	DSSSB Shift I (NO) 2019
49.	Kerala PSC (Nursing Officer) 2014	94.	DSSSB Shift II (NO) 2019
50.	Kerala PSC (Nursing Officer) Grade II: 2011	95.	DSSSB PHN 2015
51.	Kerala PSC (Nursing Officer) Set C: 2011	96.	DSSSB ANM 2015
52.	Kerala PSC (Nursing Officer) 2010	97.	Jhalawar Hospital and Medical College Society 2012
53.	BHU (Nursing Officer) 2019		

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98.	TNPSC Maternal and Child Health Officer 2015	103.	Rohtak (Nursing Officer) 2020
99.	RML Hospital (Nursing Officer) 2011	104.	NIMHANS (Nursing Officer) 2019
100.	Insurance Medical Services (Nursing Officer) 2004	105.	SKIM (Nursing Officer) 2020 Paper (New)
101.	RRC (Nursing Officer) 2012	106.	Gujarat Staff (Nursing Officer) 2021 (New)
102.	SCTIMST (Nursing Officer) 2015	107.	Jr. Grade Nurse/Jr. Staff Nurse/Jr. Nurse 2020

## 5 APPENDICES

S. No.	Topic	Sub-topic
1.	Anatomy and Physiology	<ol style="list-style-type: none"> <li>1. Blood supply of heart</li> <li>2. Lobes of brain and their functions</li> <li>3. Quadrants of abdomen</li> <li>4. Cranial nerves, their types and functions</li> <li>5. Types of joints in human body</li> <li>6. Functions of sympathetic and parasympathetic nervous system</li> <li>7. Fetal skull</li> <li>8. Fetal circulation and its postnatal changes</li> </ol>
2.	All about COVID-19	<ol style="list-style-type: none"> <li>1. Updates on COVID-19</li> <li>2. Management of COVID-19 in pregnancy</li> <li>3. Mucormycosis (black fungus)</li> <li>4. Updated questions on COVID-19</li> <li>5. Sequence of donning and doffing of PPE while caring for COVID-19 Patients</li> </ol>
3.	Instruments and Equipment	<ol style="list-style-type: none"> <li>1. Instruments</li> <li>2. Equipment/Instruments</li> <li>3. Obstetrics and Gynecological instruments</li> <li>4. Tubes and Catheters</li> <li>5. Decontamination of equipment and unit</li> <li>6. Slings and splints</li> <li>7. Cold chain methods and equipment</li> </ol>
4.	Positions and Presentations	<ol style="list-style-type: none"> <li>1. Positions</li> <li>2. Positions and presentations of fetus during Labor</li> </ol>
5.	Program, Policies and Recent Updates	<ol style="list-style-type: none"> <li>1. Recent updates on community health nursing</li> <li>2. Norms for health personnel/centers in community</li> <li>3. Demography in India</li> <li>4. Review of health programs in India, launch year and objectives</li> <li>5. Health planning in India</li> <li>6. Some Important Social Welfare/Health/Development Program Launched by Government of India from August 2014 till April 2021.</li> <li>7. Community nutrition program</li> <li>8. Immunization schedule</li> <li>9. Color coding for medical gas cylinders</li> <li>10. Biomedical waste management rules 2016</li> <li>11. Some important social welfare/health/development program launched by government of India from August 2014 till June 2023 (new)</li> </ol>
6.	Disease Conditions	<ol style="list-style-type: none"> <li>1. Updates on tuberculosis</li> <li>2. Some disease conditions and their primary signs/symptoms</li> <li>3. Communicable diseases</li> <li>4. Vitamins: functions, sources and deficiency diseases</li> </ol>
7.	Assessment, Prevention and Management	<ol style="list-style-type: none"> <li>1. Frye's ABCDE cascade for prioritizing centre</li> <li>2. Glasgow coma scale</li> <li>3. Triage categories</li> <li>4. Arterial blood gas</li> <li>5. Shocks- types, managements and solutions</li> </ol>

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S. No.	Topic	Sub-topic
		6. Skeletal and skin traction 7. ECG waveforms and pathological findings 8. Common scales used for assessment/treatment 9. Level of spinal cord injury and associated motor loss 10. Neurotransmitters chart 11. Interpretation of BMI 12. Acute coronary syndromes and their treatments 13. Level of prevention 14. Vaccines used to prevent diseases 15. Classification of mental retardation 16. EGO defence mechanisms with examples 17. Phases of wound healing process 18. Phobias 19. Blood groups 20. Burns 21. Radiating pain/referred pain 22. Endocrine glands and hormones 23. Leopold's maneuver
8.	Pharmacology	1. Specific antidotes against poisoning 2. Drug storage and temperature 3. Drugs and their actions 4. Types of insulin 5. Immunoglobulins and their characteristics
9.	Abbreviations	1. Abbreviations
10.	Measurement and Values	1. Conversion from Celsius (°C) to Fahrenheit (°F) 2. Normal values 3. Lung volumes and capacities
11.	Growth and Development	1. Growth and development 2. Comparison of components for adults, children and infants BLS/CPR 3. Stages of personality development
12.	Acts and Legislation	1. Acts and legislations

## 6 7+ STUDY PLANS

S. No.	Topic
1.	How to Prepare for NORCET 6.0 from TH
2.	How to Prepare for NORCET 7.0 from TH
3.	How to Refer TH while you are in UG
4.	New Informative Blogs
5.	How to Crack CBT Examination
6.	How to Prepare for an Interview
7.	How to Use Target High Lite 7/e – New Approach New Concept

## 7 CONCEPTUAL VIDEOS (NEW FEATURE)

200+ Important topics conceptual videos in infographic form – **Forthcoming** – Detailed list will be uploaded in the App

## 8 ANY DOUBT, ASK AMLI

Get all your queries resolved by AMLI within 48 Hrs and also get Guidance Sessions

## 9 CURRENT AFFAIRS & APTITUDE

100+ Pages E-booklet covering Current Affairs, General Knowledge, General Aptitude along with Practice Qs



## 10 CLINICAL LEARNING

CBQs, IBQs & VBQs - (350 IBQs & VBQs Pre-loaded) + (620 New CBQs) (64 New IBQs Exclusive in App)

### Clinical Case-Based Qs

S. No.	Subject	In Book & App	Exclusive in App	Total
1.	Fundamentals of Nursing	111	22	133
2.	Medical Surgical Nursing/Adult Health Nursing	186	3	189
3.	Pharmacology	–	–	–
4.	Community Health Nursing	–	–	–
5.	Psychiatric Nursing	79	–	79
6.	Pediatric Nursing	104	12	116
7.	Obstetric and Gynecological Nursing	43	60	103
8.	Applied Microbiology	–	–	–
9.	Applied Biochemistry and Nutrition	–	–	–
10.	Applied Sociology and Psychology	–	–	–
11.	Nursing Research and Statistics	–	–	–
12.	Nursing Education	–	–	–
13.	Nursing Administration and Management	–	–	–
14.	Computer/Health and Nursing Informatics	–	–	–
15.	Forensic Nursing and Indian Laws	–	–	–
16.	Anatomy and Physiology	–	–	–
17.	GK/English/Aptitude/Arithmetic and Numerical Ability	–	–	–
	<b>Total Qs</b>	523	97	620

### IBQs & VBQs

S. No.	Subject	Total Qs	IBQs [Pre-loaded (Book + App)]	New IBQs (Exclusive in App)	VBQs
1.	Fundamentals of Nursing	81	60	3	18
2.	Medical Surgical Nursing/Adult Health Nursing	109	60	26	23
3.	Pharmacology	14	12	2	–
4.	Community Health Nursing	36	32	4	–
5.	Psychiatric Nursing	26	23	3	–
6.	Pediatric Nursing	49	40	3	6
7.	Obstetric and Gynecological Nursing	73	50	17	6
8.	Applied Microbiology	28	26	2	–
9.	Applied Biochemistry and Nutrition	10	10	–	–
10.	Applied Sociology and Psychology	–	–	–	–
11.	Nursing Research and Statistics	1	–	1	–
12.	Nursing Education	3	–	3	–
13.	Nursing Administration and Management	–	–	–	–
14.	Computer/Health and Nursing Informatics	–	–	–	–
15.	Forensic Nursing and Indian Laws	–	–	–	–
16.	Anatomy & Physiology	18	18	–	–
17.	GK/English/Aptitude/Arithmetic and Numerical Ability	22	22	–	–
	<b>Total Qs</b>	474	357	64	53



## 11 BE IN SPOTLIGHT

- 500+ Reviewers' and contributors' details from 22 States & 2 Union Territories (120 Cities from India) - (In Pdf).

## 12 RECENT UPDATES

NORCET 2023 September & NORCET 2024 (Recall Papers) will be given in Pdf form – Post Examination.

## 13 3D ANIMATED VIDEOS

### Position and Presentation of Fetus During Labor

The video provides a visual portrayal of the evolving position and presentation of the fetus during different stages of labor. It illustrates how the baby's orientation within the mother's pelvis changes as labor progresses. The video highlights how these positions may impact the birthing process.



### Parts and Diameter of Fetal Skull

The video demonstrates the components and dimensions of the fetal skull, highlighting its dynamic and complex nature. The fetal skull consists of vital parts and diameters crucial for assessing development and facilitating safe childbirth. Fontanelles, soft areas where skull bones have yet to fuse and Sutures, like the sagittal running from front to back and the coronal crossing from ear to ear, permit gentle movement.

### Body Planes and Movement

The video explains the midsagittal, sagittal, coronal or frontal and transverse or horizontal planes of the body along with description of terms related to different body movements like-flexion, extension, adduction, abduction, supination, pronation, etc. to enhance conceptual knowledge related to body movements and anatomical planes.



### Physiology of Respiration-Exchange of Gases

The video demonstrates the exchange of gases during respiration. Respiration, in the context of living organisms, refers to the process of exchanging gases between an organism and its environment. It involves the intake of oxygen ( $O_2$ ) and the release of carbon dioxide ( $CO_2$ ). This is the vital Process for maintaining the proper functioning of cells and sustaining life in various organisms.

### Anatomy of Heart and Cardiac Cycle

The video demonstrates the external features of heart, chambers of the heart, blood supply, conduction system and electrical events of heart along with conceptual and thorough description of all the events and mechanism of cardiac cycle.



Section

B



## GENERAL KNOWLEDGE AND APTITUDE

- General Knowledge
- General English and Comprehension
- General Intelligence and Reasoning Ability
- Arithmetical and Numerical Ability

“When you are sick of your sickness, you are no longer sick.”

—Chinese Proverb

CHAPTER

1



GENERAL KNOWLEDGE

**FIRST IN INDIA (MALE)**

First Governor of Bengal	Lord Clive
First Governor General of Bengal	Warren Hastings
First Governor General of India	Lord William Bentinck
First Viceroy of India	Lord Canning
First President of Indian National Congress	W. C. Banerjee
First Muslim President of Indian National Congress	Badruddin Tayab Ji
First Governor General of Independent India	Louis Mountbatten
First Indian Governor General of Independent India	C. Rajagopalachari
First Indian to pass ICS Exam	Satyendranath Tagore
First Indian Cosmonaut (to go into space)	Sqn. Ldr. Rakesh Sharma
First Indian Judge of International Court of Justice	Dr Nagendra Nath
First Indian to get Bharat Ratna Award	C. Rajagopalachari, Sarvepalli Radhakrishnan and C. V. Raman
First Indian to swim across the English Channel	Mihir Sen
First Muslim President of India	Dr Zakir Hussain
First Speaker of Lok Sabha	G. V. Mavlankar
First President of Independent India	Dr Rajendra Prasad
First Vice-President of Independent India	Dr S. Radhakrishnan
First Prime Minister of Independent India	Pt. Jawahar Lal Nehru
First Education Minister of Independent India	Maulana Abul Kalam Azad
First person to get Paramvir Chakra	Major Somnath Sharma
First Indian Scientist to get Nobel Prize	C. V. Raman

Contd...

First Chinese pilgrim to visit India	Fa-Hien
First Minister to resign from Indian Union Cabinet	Shyama Prasad Mukherjee
First British to visit India	John Mildenhall
First Chief Justice of India	Hiralal J Kania

**FIRST IN INDIA (FEMALE)**

First Woman President of India	Pratibha Devi Singh Patil
First Woman Prime Minister of India	Indira Gandhi
First Woman Governor of Indian State	Sarojini Naidu
First Woman Ruler of Delhi Throne	Razia Sultan
First Woman IPS Officer	Kiran Bedi
First Woman Chief Minister of Indian State	Sucheta Kripalani (UP)
First Woman Union Minister	Rajkumari Amrit Kaur
First Woman President of Indian National Congress	Annie Besant
First Woman Judge of Supreme Court	Meera Sahib Fatima Bibi
First Woman to get Ashoka Chakra	Nirja Mishra
First Indian Woman Ambassador at United Nations	Vijayalakshmi Pandit
First Indian Woman to swim across English Channel	Arati Saha Gupta
First Indian Woman to get the Nobel Prize	Mother Teresa
First Indian Woman to climb the Mount Everest	Bachendri Pal
First Indian Woman to become Miss World	Reita Faria
First Indian Woman to become Miss Universe	Sushmita Sen

Contd...

First Indian Woman to climb Mt. Everest twice	Santosh Yadav
First Indian Woman to get Bharat Ratna	Indira Gandhi
First Indian Woman to win WTA Title	Sania Mirza
First Indian Woman president of INC	Sarojini Naidu
First Indian Woman to go into Space	Kalpana Chawla
First Woman Musician to get Bharat Ratna	MS Subbulakshmi
First Woman Chief Justice of High Court	Leela Seth

### REVOLUTIONS IN INDIA

Revolution	Field	Person associated with
Black Revolution	Petroleum Production	–
Blue Revolution	Fish Production	Dr Arun Krishnan
Brown Revolution	Cocoa/Leather/ Non-Conventional Products	–
Grey Revolution	Fertilizers	–
Golden Revolution	Horticulture/ Honey/Fruit	Nirpakh Tutej
Golden Fiber Revolution	Jute Production	–
Pink Revolution	Onion and Prawn Production/ Pharmaceuticals	Durgesh Patel
Red Revolution	Meat and Tomato Production	Vishal Tewari
Silver Revolution	Egg/Poultry Production	Indira Gandhi
Silver Fiber Revolution	Cotton	–
Round Revolution	Potato	–
White Revolution (Or Operation Flood)	Dairy and Milk Production	Vergheese Kurien
Green Revolution	Food Grains	Norman Borlaug, M.S Swaminathan, William Gaud (UK)
Yellow Revolution	Oil Seed Revolution (Especially Mustard and Sunflower)	Sam Pitroda
Protein Revolution	Higher Production (Technology driven 2nd Green Revolution)	PM Modi and Arun Jaitley

### INTERNATIONAL ORGANIZATIONS, HEADQUARTERS AND HEAD

Organization name	Headquarters	Head
World Bank	Washington DC, US	David Malpass
International Monetary Fund (IMF)	Washington DC, US	Kristalina Georgieva
United Nations Children's Emergency Fund (UNICEF)	New York, US	Henrietta H Fore
United Nations Organization (UN)	New York, US	Antonio Guterres
United Nations General Assembly (UNGA)	New York, US	Abdulla Shahid
United Nations Population Fund (UNFPA)	New York, US	Dr Natalia Kanem
World Health Organization (WHO)	Geneva, Switzerland	Dr Tedros Adhanom Ghebreyesus
World Economic Forum (WEF)	Geneva, Switzerland	Klaus Schwab
International Labor Organization (ILO)	Geneva, Switzerland	Guy Ryder
World Trade Organization (WTO)	Geneva, Switzerland	Ngozi Okonjo-Iweala
World Intellectual Property Organization (WIPO)	Geneva, Switzerland	Daren Tang
World Meteorological Organization (WMO)	Geneva, Switzerland	David Grimes
United Nations Education Scientific and Cultural Organization (UNESCO)	Paris, France	Audrey Azoulay
International Atomic Energy Agency (IAEA)	Vienna, Austria	Rafael Mariano Grossi
International Maritime Organization (IMO)	London, UK	Kitack Lim
Commonwealth of Nations	London, UK	Queen Elizabeth II
Association of South East Nations (ASEAN)	Jakarta, Indonesia	Lim Jock Hoi

Contd...



A good laugh and a long sleep are the best cures in the doctor's book.

—Irish Proverb

CHAPTER

# 2



## GENERAL ENGLISH AND COMPREHENSION

### This Chapter Contains:

- Parts of Speech
- Articles
- Tenses
- Jumbled Words
- Antonyms
- Synonyms
- Idioms and Phrases

### PARTS OF SPEECH

The parts of speech play a crucial role in English grammar and composition. They clarify the functions and meaning along with their grammatical use in a sentence. One single word can be used as more than one part of speech in different circumstances. Understanding parts of speech is essential for determining the correct definition of a word.

#### Nouns

A noun refers to the name of a person, place, thing or object. Basically, anything that names a “thing” is a noun, whether you’re talking about a basketball court, San Francisco, Cleopatra or self-preservation.

Nouns are of various types: Common nouns, proper nouns, abstract nouns and concrete nouns; or nouns could be of countable and non-countable types as well.

#### Pronouns

Pronouns are the substitutes for specific nouns when the reader or listener already knows which specific noun you are referring to.

You might say, “Jenny was supposed to be here at eight,” then follow it with “She’s always late; next time I’ll tell her to be here half an hour earlier.”

Instead of saying Jenny’s name three times in a row, you substituted *she* and *her*, and your sentences remained grammatically correct.

#### Adjectives

Adjectives are the words that describe nouns. Think about your favorite movie. How would you describe it to a friend who’s never seen it?

You might say the movie was funny, engaging, well-written, or suspenseful. When you’re describing the movie with these words, you’re using adjectives. An adjective can go right before the noun it’s

describing (“I have a black dog”), but it doesn’t have to. Sometimes, adjectives are at the end of a sentence (“My dog is black”).

#### Verbs

**Go! Be amazing! Run as fast as you can! Win the race! Congratulate every participant who put in the work and competed!**

Those bold words are verbs. Verbs are words that describe specific actions, like **running**, **winning**, and **being** amazing.

Not all verbs refer to literal actions, though. Verbs that refer to feelings or states of being, like **to love** and **to be**, are known as **nonaction verbs**. Conversely, the verbs that do refer to literal actions are known as **action verbs**.

#### Adverbs

An adverb is a word that describes an adjective, a verb, or another adverb.

I entered the room quietly.

*Quietly* is describing how you entered (verb) the room.

*A cheetah is always faster than a lion.*

*Always* is describing how frequently a cheetah is faster (adjective) than a lion.

#### Prepositions

Prepositions tell you the relationships between other words in a sentence.

You might say, “I left my bike leaning **against** the garage.” In this sentence, **against** is the preposition because it tells us where you left your bike.

Here’s another example: “She put the pizza **in** the oven.” Without the preposition **in**, we don’t know where the pizza is.

#### Which Preposition to Use and When

Sometimes it may be a little difficult to decide which preposition to use. Thus, the following prepositions need careful handling:

1. **In, at:** ‘In’ is used with the name of continents, countries, states, sizeable territories and large cities. ‘At’ is used with towns, villages, etc.  
He is not at home. He lives at Batala.  
He lives in Punjab.  
He lives at Chandarnagar in Bengal.  
But when we speak of very large places, we usually say:  
He lives in London in England (not at London).  
He died in Paris in France. (not at Paris)

2. **At/on:** Compare the following sentences:  
He sat at the table.  
He sat on the table.  
'At' in the first sentence means that he sat with his chair drawn up to the table.  
'On' in the second sentence means that he sat on top of the table.
3. **Between, among:** 'Between' is used in speaking when two persons or things are connected.  
'Among' is used in speaking when more than two persons or things are connected.  
The cat sat between Mohan and Rohan.  
**USAGE:** 'Between' can also relate to more than two persons or things, when we have a definite number in mind.
4. **In, within:** 'In' means at the end of, 'within' means before the end of.  
He will return in a week. (at the end of week)  
He will return within a week. (before the end of a week)
5. **At, about:** 'At' is used with a fixed moment; 'about' indicates proximity to a certain time.  
He left work at four o'clock.  
It is about four now.  
Expressions like at about four o'clock, at about the time he left work, are therefore wrong.
6. **Till, by:** 'Till' means not earlier than; 'by' means not later than.  
For example, I was kept waiting till 3 o'clock (up to 3 o'clock). or I shall return home by 3 o'clock (not later than 3 o'clock)
7. **Since, for:** 'Since' as a preposition is used before a noun or phrase denoting some point of time; 'for' is used to denote a period of time; for example, he has been working since morning.  
I have been doing nothing for two hours.  
I have been living in Mumbai since 1980.  
**Note:** Since is preceded by a verb in perfect tense.
8. **To, till/until-till:** means up to:  
These are used with 'from'. 'To' cannot be used without 'from' though 'however' can be used alone.  
We work from 8 am to 4 pm.  
We work till 4 pm.  
'Until' cannot be used with a negative verb.

## Conjunctions

Conjunctions make it possible to build complex sentences that express multiple ideas.

"I like tomato sauce. I like chilli sauce. I don't like mango sauce."

Each of these three sentences expresses a clear idea. There's nothing wrong with listing your preferences like this, but it's not the most efficient way to do it.

**Consider instead:** "I like tomato sauce **and** chilli sauce, **but** I don't like mango sauce.

In this sentence, *and* and *but* are the two conjunctions that link your ideas together.

## Interjections

Interjections are a part of speech used to convey or express sudden feelings and emotions. There are no particular rules as to where interjections should be placed in a sentence, but most often, they are

seen to appear in the beginning of a sentence. They are used to form exclamatory sentences.

### Examples

Here are some examples of interjections to show you how they can be used in sentences effectively.

- **Hurray!** We won the match.
- **Ouch!** That really hurt badly.

## ARTICLES

A man. **The** Golden Temple. **An** honest businessman.

The bold words shown above are known as articles. Articles come in two forms: **definite articles** and **indefinite articles**. The definite article, **the** describes one specific noun. **A** and **An** are indefinite articles.

*Did you buy **the** car?*

From the given sentence, we understand that the speaker is referring to a specific car, not any general car.

Now, discuss an indefinite article:

*Did you drive **a** vehicle?*

The given sentence refers to any vehicle which you drove, not any specific vehicle. This shows the use of an indefinite article, i.e., 'a'.

'A' is used with the words which are pronounced with initial consonant sound. E.g., a union, a one-legged man, a pet, a door. '**An**' is used with the words which are pronounced with initial vowel sound. E.g., an apple, an elbow.

## TENSES

Tenses refer to the use of different forms of the verbs according to the time of that action.

Tense	Present	Past	Future
Simple	S + V1 + O (Truth/Habit) E.g., He goes for a walk daily.	S + V2 + O (Completed action) E.g., I graduated in 2016.	S + will/shall + V1 + O (Any future action) E.g., I will study French next year.
Continuous	S + is/am/are + V1 + ing + O (Ongoing action) E.g., I am going.	S + was/were + V1 + ing + O (Incomplete task of past) E.g., I was sleeping when he called.	S + will be/shall be + V1 + ing + O (Future incomplete action) E.g., I will be dancing tomorrow.
Perfect	S + has/have + V3 + O (Perfectly complete) E.g., I have completed my work.	S + had + V3 + O (Completed action w.r.t. another) E.g., I had left the city.	S + will have + V3 + O (Completed action of future w.r.t. another) E.g., I will have gone by that time.



Contd...

Tense	Present	Past	Future
Perfect Continuous	S + has/have + been + V1 + ing + O (Started in past and Still continue) E.g., I have been writing since 1 pm	S + had been + V1 + ing + O (Past incomplete action w.r.t. another) E.g., I had been living in Mumbai for three years.	S + will have been + V1 + ing + O (Future incomplete action w.r.t. another) E.g., She will have been reading a novel.

## JUMBLLED WORDS

Read the following words and arrange them to make a meaningful sentence:

- dealer / favor / that/ was / in / of /that proposal / said / he/ the Dealer said that he was in the favor of that proposal.
- was / performance /impressed /with/ very / his/he He was very impressed with his performance.

## ANTONYMS

A word opposite in meaning or sense to a given word is called its antonym. Antonyms are of three types:

- Words without any prefix or suffix. Such words are called direct Antonyms.**

Study the following examples:

Words	Antonyms
Abundance	Dearth
Abject	Elevated
Zenith	Nadir

- Antonyms can be formed by using a prefix before a word.**

Some important prefixes are: In, un, dis. Mark the following examples:

Words	Antonyms
Ability	Inability
Well	Unwell
Advantage	Disadvantage

- Some Antonyms can be formed by changing the suffix of a given word.** Mark the following examples:

Words	Antonyms
Careful	Careless
Faithful	Faithless
Advantage	Disadvantage

## SYNONYMS

A synonym is a word that has almost the same meaning as another word. For example, a synonym for beautiful is stunning.

- She is a beautiful girl.
- She is a stunning girl.

In this part, antonyms and synonyms of real importance have been given.

Word	Antonym	Synonym
Abandon	Retain	Leave
Absurd	Relevant	Illogical
Alive	Dead	Lively, Vivacious
Abundance	Scarcity	Plenty
Assemble	Disperse	Gather
Audible	Inaudible	Detectable, Observable
Blunt	Sharp	Unsharpened, Edgeless
Blessing	Curse	Grace, Benediction
Bold	Timid	Courageous
Benediction	Malediction	Blessing
Care	Neglect	Concern
Coarse	Fine	Crude, Unrefined
Contract	Expand	Shrink
Concord	Discord	Harmony
Conceal	Reveal	Obscure, Camouflage
Dense	Sparse	Opaque, Solid, Close-knit
Despair	Hope	Despondency, Dejection
Emigrant	Immigrant	Alien, Foreigner
Firm	Shaky	Condensed, Solid
Foreign	Native	Non-native, Overseas, Distant
Fresh	Stale	Revived, Lively
Futile	Fruitful	Inefficacious
Inferior	Superior	Subservient, Junior
Ignorance	Knowledge	Incomprehension
Gather	Scatter	Congregate
Giant	Dwarf	Gigantic, Colossal
Grieve	Rejoice	Mourn, Lament
Harmony	Discord	Euphony
Optional	Compulsory	Discretionary
Optimist	Pessimist	Idealizer, Propitious
Obligatory	Optional	Statutory
Pardon	Punish	Condonation
Praise	Condemn/blame	Commend
Poison	Antidote	Toxin
Plenty	Scarcity	Plethora
Predecessor	Successor	Precursor, Prototype
Peculiar	Normal	Idiosyncratic
Ruthless	Merciful	Cold-blooded
Respect	Insult	Adoration
Steady	Unstable	Unwavering

Contd...



“One day in perfect health is much.”

—Arabic proverb

CHAPTER

3



# GENERAL INTELLIGENCE AND REASONING ABILITY

## CODING-DECODING

Alphabet test-based questions are generally asked which require an understanding of positions of alphabets in the series.

Forward number	Alphabet	Forward number	Alphabet
1	A	14	N
2	B	15	O
3	C	16	P
4	D	17	Q
5	E	18	R
6	F	19	S
7	G	20	T
8	H	21	U
9	I	22	V
10	J	23	W
11	K	24	X
12	L	25	Y
13	M	26	Z

- In a certain code language, “BOY” is written as “21225”. What will be the code for “GIRL” in the same language?
  - 791218
  - 792181
  - 791812
  - 791281
- In a certain code language, “You are good.” is written as “la ba ma” and “I am bad.” is written as “ca sa pa”. What will be the code for “Am I good?” in the same language?
  - sa ca ma
  - sa la ma
  - sa ca ba
  - sa pa ca
- In a certain code, “APPLE” is written as “ZOOKD”. What will be the code for “BANANA” in the same language?
  - AAMZMZ
  - AZMZNZ
  - AZMZBZ
  - AZMZMZ
- How many letters are there between 8th letter from left and 7th letter from right in alphabet series?
  - 11
  - 7
  - 8
  - 10
- In a certain code, FILE is written as 7465 and IDEAL is written as 43586. How will DEAF be written in that code language?
  - 3587
  - 3467
  - 3764
  - 3827

## ANALOGY

Analogy means similarity, i.e., a particular relationship between words/letters/numbers will be given and another similar relationship we have to find from the options.

Questions:

- “Cock” is related to “Hen” in the same way as “Peacock” is related to:
  - Peahen
  - Parrot
  - Pigeon
  - Bird
- Brick: Wall: House
  - Eyes: Lashes: See
  - Water: River: Sea
  - Hands: Legs: Body
  - Cell: Tissue: Organ
- 12 : 144 :: 17 :
  - 199
  - 289
  - 241
  - 179
- ASTN : ZTSO :: MSUB :
  - ALCY
  - LTTC
  - LRRC
  - LTTA
- BOY : 6 :: HONEY :
  - 8
  - 6
  - 4
  - 7

## NUMBER SYSTEM

Number series is a sequential arrangement of numbers in which numbers follow a certain pattern. This pattern can be based on:

- Addition/Subtraction of numbers:** If the number series is increasing slowly, then it will be addition series otherwise if the numbers are decreasing slowly, then that will be a subtraction series.
  - Find the next number in the given series: 7, 12, 19, 28, 39, ...
    - 51
    - 52
    - 53
    - 54
  - Find the next number in the given series: 40, 30, 22, 16, .....
    - 12b.
    - 16
    - 14d.
    - 50
- Multiplication/Division of numbers:** If the number series is increasing rapidly, then it will be multiplication series otherwise if the numbers are decreasing rapidly, then that will be a division series.
  - Find the next number in the given series: 20, 100, 600, 4200, 33600, .....
    - 302300
    - 302400
    - 302600
    - 302700

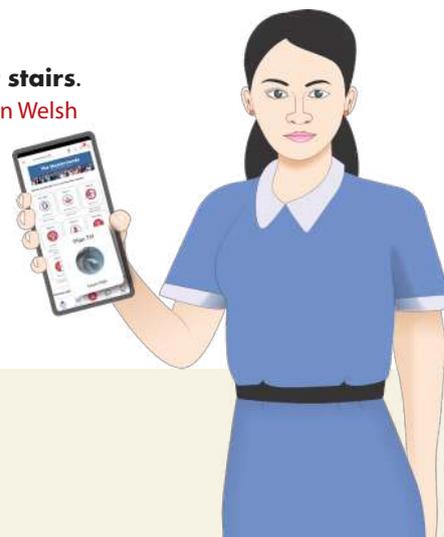


A man's health can be judged by which he takes two at a time - pills or stairs.

—Joan Welsh

## CHAPTER

# 4



# ARITHMETICAL AND NUMERICAL ABILITY

## NUMBER SYSTEM

1. **Natural numbers:** Numbers from 1 to infinity are known as natural numbers.
2. **Whole numbers:** Natural numbers including zero (0) are known as whole numbers.
3. **Integers:** Integers are a set of numbers that include zero, positive numbers, and negative numbers. Examples of Integers: - 1, -12, 6, 15.
  - **Positive integers:** It includes all the positive numbers. For example, 1, 2, 3, 4, 5, 6....., etc.
  - **Negative integers:** It includes all the negative numbers. For example -1, -2,-3,-4,-5,-6....., etc.
4. **Rational numbers:** A number which we can write in p/q form, where p is an integer and q is not equal to zero is known as a rational number. For example: 4/5, 6/7, 1/5, etc.
5. **Irrational numbers:** The numbers which cannot be expressed in p/q form are known as irrational numbers. Also, the decimal expressions of these numbers are nonterminating and nonrepeating. For example:,  $\sqrt{2}$ ,  $\sqrt{3}$ ,  $\sqrt{5}$ ....etc.
6. **Real numbers:** The combination of rational and irrational numbers is known as real numbers. For example: 11/23, etc.
7. **Prime numbers:** The number which is divisible by only 1 or by itself is known as prime number. For example: 2, 3, 5, 7, etc.
8. **Composite numbers:** Numbers that have more than two factors are known as composite numbers. For example: 4, 6, 8, etc.
9. **Co-prime numbers:** Numbers having only one common factor are called co-prime numbers. For example: (3,7) (8,9), etc.

## LCM AND HCF

- **Least common multiple (LCM):** The least number which is exactly divisible by two or more numbers is known as LCM.  
**Example:** If we consider the multiples of 16 and 20, we get:  
Multiples of 16 are 16, 32, 48, 64, **80**,...  
Multiples of 20 are 20, 40, 60, **80**,...  
We can see that the first common multiple for both the numbers is 80. So, LCM of 16 and 20 is 80.
- **Highest common factor (HCF):** The greatest factor between two or more numbers is known as HCF.  
**Example:** Highest common factor of 144, 104, and 160. Now write the prime factors of 144, 104 and 160.  
 $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$   
 $104 = 2 \times 2 \times 2 \times 13$   
 $160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$   
The common factors of 144, 104 and 160 are  $2 \times 2 \times 2 = 8$   
Therefore, HCF (144, 104, 160) = 8

## HCF AND LCM OF FRACTIONS

- **HCF of fraction:** HCF of numerators/LCM of denominators
- **LCM of fraction:** LCM of numerators/ HCF of denominators

## TEST OF DIVISIBILITY

Divisibility by number	Divisibility Rule
<b>Divisible by 2</b>	A number whose unit digit is an even number, i.e., 0, 2, 4, 6, and 8 is divisible by 2, e.g., 78, 86, 70, etc.
<b>Divisible by 3</b>	If sum of all the digits of any number is divisible by 3 then the number is divisible by 3, e.g., 39, 81, etc.
<b>Divisible by 4</b>	If the last two digits of a number is divisible by 4 or include 00 then it is divisible by 4, e.g., 78924, 6732, etc.
<b>Divisible by 5</b>	Numbers whose unit digit is 0 or 5 are divisible by 5, e.g., 780,7895, etc.
<b>Divisible by 6</b>	A number which is divisible by 2 and 3 both is divisible by 6, e.g., 4536, 8124, etc.
<b>Divisible by 8</b>	If the last three digits of a number is divisible by 8 or include 000 then it is divisible by 8, e.g., 5647472.
<b>Divisible by 9</b>	If sum of all the digits of any number is divisible by 9 then the number is divisible by 9, e.g., 3933, 729, etc.
<b>Divisible by 10</b>	Any number whose unit digit is 0 is divisible by 10, e.g., 3930, 7290, etc.
<b>Divisible by 11</b>	If the difference of the sums of the alternative digits of a number is divisible by 11 then the number is divisible by 11, e.g., 1331, 10824,etc.

**Example:** Check if the number 2347974 is divisible by 8 or 11?

**Solution:** For checking any number's divisibility with 8, we check for the divisibility of last three digits of a number by 8 or the presence of 000. So, here, 000 is not there. We will check the divisibility of 974 by 8.

974 is not completely divisible by 8.

For checking any number's divisibility with 11, we check for the difference of sum of alternate digits of the given number. If it comes out to be a factor of 11 then it will be divisible by 11.

So,  $(2+4+9+4) - (3+7+7) = 19 - 17 = 2$

This brings us to the conclusion that the given number is **neither divisible by 8 nor by 11**.

## SIMPLIFICATION

### BODMAS Rule

The BODMAS rule is essential in many mathematical problems. The full form of BODMAS is:

- B – Brackets,
- O – Order of powers or roots,
- D – Division,
- M – Multiplication,
- A – Addition,
- S – Subtraction.

## IMPORTANT ALGEBRAIC FORMULAS

Some important algebraic formulas are as follows:

- $a^2 - b^2 = (a - b)(a + b)$
- $(a + b)^2 = a^2 + 2ab + b^2$
- $a^2 + b^2 = (a + b)^2 - 2ab$
- $(a - b)^2 = a^2 - 2ab + b^2$
- $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
- $(a - b - c)^2 = a^2 + b^2 + c^2 - 2ab + 2bc - 2ca$
- $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$ ;  $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$
- $(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 = a^3 - b^3 - 3ab(a - b)$
- $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
- $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
- $(a + b)^4 = a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + b^4$
- $(a - b)^4 = a^4 - 4a^3b + 6a^2b^2 - 4ab^3 + b^4$

## PERCENTAGE

A percentage is a number or ratio which is expressed as a fraction of 100 and it is denoted by using '%' symbol.

$$\text{Percentage} = \frac{\text{Value obtained}}{\text{Total value}} \times 100$$

**Example:**

1. A class of 120 students have 40 girls, rest of the students are boys. What is the percentage of boys in that class?

**Solution:**

$$\text{Percentage} = \frac{\text{Value obtained}}{\text{Total value}} \times 100$$

$$\text{Total students} = \text{Total value} = 120$$

Total number of boys, for which percentage has to be calculated:

$$120 - 40 = 80$$

$$\text{Percentage of boys} = \frac{80}{120} \times 100 = 66.66\%$$

## AVERAGE

The average or arithmetic mean is defined as the mean value which is equal to the ratio of the sum of a number of a given set of values to the total number of values present in the set.

$$\text{Average} = \frac{\text{Sum of observations}}{\text{Total number of observations}}$$

### Some Important Point to Remember

- Average of the first 10 whole numbers is 4.5

- Average of the first 10 natural numbers is 5.5
- Average of the first 10 even numbers is 11
- Average of the first 10 odd numbers is 10

**Example:**

1. Find the average of 2, 4, 6, 8, 10.

**Solution:**

$$\text{Average} = \frac{\text{Sum of observations}}{\text{Total number of observations}}$$

$$\text{Sum of observations} = 2 + 4 + 6 + 8 + 10 = 30$$

$$\text{No. of Observations} = 5$$

By putting the values,

$$\text{Average} = \frac{30}{5}$$

$$\text{Average} = 6$$

## PROFIT AND LOSS

**Cost Price (CP):** The price at which a product is purchased is called cost price.

**Selling Price (SP):** The price at which a product is sold is called the selling price.

**Profit/Gain (P):** If a product is sold at a price that is more than its cost price then the seller makes a profit.

**Loss (L):** If a product is sold at a price that is less than its cost price then the seller makes a loss.

### Some Important Formula

- Profit,  $P = SP - CP$ ;  $SP > CP$
- Loss,  $L = CP - SP$ ;  $CP > SP$
- $P\% = (P/CP) \times 100$
- $L\% = (L/CP) \times 100$
- $SP = \{(100 + P\%)/100\} \times CP$
- $SP = \{(100 - L\%)/100\} \times CP$
- $CP = \{100/(100 + P\%)\} \times SP$
- $CP = \{100/(100 - L\%)\} \times SP$

**Example:**

1. A man buys a shirt of ₹1000 and sells it at a loss of 15%. What is the selling price of the shirt?

**Solution:**

Cost Price of the shirt is ₹1000

The loss percentage is 15%

As we know, Loss percentage =  $(\text{Loss}/\text{Cost Price}) \times 100$

$$15 = (\text{Loss}/1000) \times 100$$

Therefore, Loss = 150 ₹

As we know,

$$\text{Loss} = \text{Cost Price} - \text{Selling Price}$$

So, Selling Price = Cost Price - Loss

$$= 1000 - 150$$

$$\text{Selling Price} = ₹850/-$$

So, selling price of the shirt is ₹850/-

2. A man gains 30% by selling a watch for a certain price. If he sells it at double the current selling price, then what will be the profit percentage?

**Solution:**

Let, the cost price be ₹ x.

∴ Selling price = ₹ 1.3x

Now, new SP = ₹ 2.6x

∴ Profit % =  $[(2.6x - x) \times 100] = 160\%$



**Example:**

1. Find the total surface area of a cylinder with radius of base 3.5 cm and the height 20 cm.

**Solution:**

$$\begin{aligned} \text{Radius} &= 3.5 \text{ cm} \\ \text{Height} &= 20 \text{ cm} \\ \text{Total surface area} &= 2\pi rh + 2\pi r^2 = 2\pi r(h + r) \\ &= \left[ 2 \times \frac{22}{7} \times 3.5 \times (20 + 3.5) \right] \\ &= 517 \text{ cm}^2 \end{aligned}$$

2. A hemisphere whose surface area is 50 sq. inches. Find its volume.

**Solution:**

$$\begin{aligned} \text{The surface area of hemisphere} &= 50 \text{ sq. inches} \\ \text{The formula of Surface area of the hemisphere} &= 2\pi r^2 \\ 50 &= 2\pi r^2 \\ r^2 &= 50/2\pi \quad (\pi = 3.14) = 7.96 \\ r &= 2.82 \end{aligned}$$

The radius of the hemisphere is 2.82 inches

$$\begin{aligned} \text{Volume of a hemisphere} &= \frac{2}{3} \pi r^3 \text{ cubic units} \\ &= \frac{2}{3} \times 3.14 \times (2.82)^3 \\ &= \frac{2}{3} \times 3.14 \times 22.43 \\ &= \frac{2}{3} \times 70.43 = 46.96 \end{aligned}$$

The volume of the hemisphere is 46.96 cm<sup>3</sup>

3. If radius and height of a cone are 4 cm and 3 cm respectively then find its area.

**Solution:**

Given, radius of cone = 4 cm and height of cone = 3 cm.

As per the formula of area of cone, we know;

$$\text{Slant height} = l = \sqrt{(4^2 + 3^2)} = \sqrt{25} = 5 \text{ cm}$$

$$\begin{aligned} \text{Area} &= \pi r(r + l) \\ &= (22/7) \times 4(4 + 5) \\ &= (22/7)36 \\ &= 113.14 \text{ cm}^2 \end{aligned}$$

**PRACTICE QUESTIONS**

- If the product of three consecutive integers is 120, then the sum of the integers is:
  - 9
  - 12
  - 14
  - 15
- A man can row  $\frac{3}{4}$  of a km against the stream in  $11\frac{1}{4}$  minutes and return in  $7\frac{1}{2}$  minutes, find the speed of the man in still water.
  - 3 km/hr
  - 4 km/hr
  - 5 km/hr
  - 6 km/hr
- The profit earned by selling an article for 832 is equal to the loss incurred when the same article is sold for 448. What should be the sale price for making 50% profit?
  - 920
  - 960
  - 1060
  - 1200
- The ratio between the length and the breadth of a rectangular park is 3:2. If a man cycling along the boundary of the park at the speed of 12 km/hr completes one round in 8 minutes, then the area of the park (in sq. m) is:
  - 15360 sq. m
  - 153600 sq. m
  - 30720 sq. m
  - 307200 sq. m
- If the selling price is doubled, the profit triples. Find the profit percent.
  - 150%
  - 200%
  - 100%
  - 400%
- A father is now three times as old as his son. Five years back, he was four times as old as his son. What is the age of the son is:
  - 12
  - 15
  - 18
  - 20
- If 35% of a number is 175, then what percent of 175 is that number?
  - 35%
  - 65%
  - 280%
  - None of the above
- An airplane covers a certain distance at a speed of 240 km/h in 5 hours. To cover the same distance in  $1\frac{2}{3}$  hours, it must travel at a speed of:
  - 300 km/h
  - 360 km/h
  - 600 km/h
  - 720 km/h
- The perimeter of a rectangular field is 480 meters and the ratio between the length and the breadth is 5:3 the area is:
  - 1350 sq. m
  - 1550 sq. m
  - 13500 sq. m
  - 15500 sq. m
- A star is  $8.1 \times 10^{13}$  km away from the earth. Suppose light travels at the speed of  $3.0 \times 10^5$  km per second how long will it take the light from the star to reach the earth?
  - $7.5 \times 10^3$  hours
  - $7.5 \times 10^4$  hours
  - $2.7 \times 10^{10}$  seconds
  - $2.7 \times 10^{11}$  seconds
- Today is Amit's birthday. One year from today he will be twice as old as he was 12 years ago. Find the current age of Amit.
  - 18 years
  - 16 years
  - 22 years
  - 25 years
- If a: b: c = 2: 4: 6, then the ratio of (a + b + c) : c is equal to:
  - 2:1
  - 1:2
  - 3:2
  - 2:3
- The C.P. of an article is 20% of the S.P. The percent that the S.P. is of C.P. is
  - 250
  - 240
  - 500
  - 40
- 8 out of 2400 parts of a container is water. What is the fraction of water in the container?
  - $\frac{1}{3}$
  - $\frac{11}{50}$
  - $\frac{1}{45}$
  - $\frac{2}{45}$
- The simple interest at 5% for 2 years will be ₹200 on a sum of:
  - ₹500
  - ₹20000
  - ₹2000
  - ₹1000
- Find the average of the following sets of scores: 567, 234, 467, 123, 324, 345, 601
  - 380
  - 426
  - 652
  - 257



17. The length of a room is 6 m and the width is 4 m. Find the cost of paving the floor by slab at the rate of ₹600 per square meter.
18.  $15\%$  of  $578 + 22.5\%$  of  $644$  is:

- a. 15670                      b. 14400  
c. 15390                      d. 14290
- a. 241.7  
b. 238.98  
c. 231.60  
d. 237.65

### Practice Exercises

#### Answers

1.	d	2.	c	3.	b	4.	b	5.	c	6.	b	7.	d	8.	d	9.	c	10.	b
11.	c	12.	a	13.	c	14.	a	15.	c	16.	a	17.	b	18.	c				

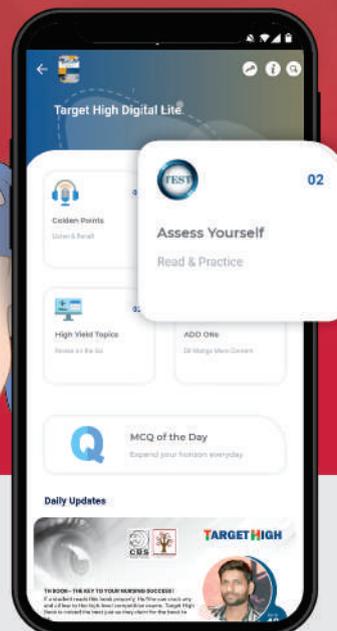
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