

**GOVERNMENT OF KARNATAKA  
DEPARTMENT OF SCHOOL EDUCATION**

**LEARNING OUTCOME BASED ASSESSMENT (LBA)**

# **QUESTION BANK**

**2026-27**

**SUBJECT : SCIENCE**

**CLASS : 8<sup>TH</sup> STANDARD**

**MEDIUM : ENGLISH**



**DEPARTMENT OF STATE EDUCATIONAL  
RESEARCH AND TRAINING (DSERT)**

Banashankari, Third Stage, Bengaluru – 560085

**— AND —**

**DISTRICT INSTITUTE OF EDUCATION AND TRAINING  
(DIET) TUMKURU**

**Government of Karnataka**

**Department of School Education**

**Learning outcome Based Assessment (LBA) Question Bank  
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**District Institute of Education and Training (DIET),  
Tumakuru.**

| <b>Concept and Guidance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                             |
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## **Preface**

### **‘Learn Science, Ask Questions, Find Answers’**

Science is not just a collection of facts and information; it is a continuous journey of curiosity, observation and exploration. The Learning Outcome Based Assessment (LBA) Question Bank initiative has been prepared with the aim of developing 21st century skills like scientific temper, critical thinking, creativity etc. in students..

To ensure that learning is not limited to textbooks but is transformed into meaningful understanding of everyday life, the Department of State Educational Research and Training (DSERT) has come up with the Learning Outcome Based Question Bank. Each lesson and the basic concepts in it are systematically mapped to specific Learning Outcomes (LOs). This project will be very helpful in meaningfully assessing and evaluating the learning progress of children, identifying learning gaps and preparing students for surveys like NAS, CSAS, PARAKH and state and national level competitive examinations like NMMS. The successful implementation of this initiative is in the hands of our dedicated teachers. Teachers should deeply understand these mapped learning outcomes and create a dynamic and activity-based classroom environment. This initiative should be used continuously at every stage from the classroom process to evaluation (CCE).

I hope that this learning outcome-based questionnaire initiative will be an inspiring guide for teachers and students. The department expresses its gratitude to all the resource persons, mentors and reviewers who have worked hard to prepare the said initiative.

**Director**

**DSERT, Bangalore**

## Guidance for Teachers (ಶಿಕ್ಷಕರಿಗೆ ಮಾರ್ಗಸೂಚಿ)

1. ಶಿಕ್ಷಕರು, ಸಂಪನ್ಮೂಲ ವ್ಯಕ್ತಿಗಳು, ಇಲಾಖೆಯ ಎಲ್ಲಾ ಹಂತದ ಅನುಷ್ಠಾನಾಧಿಕಾರಿಗಳು ಮೊದಲಿಗೆ ಪಠ್ಯಕ್ರಮದ ಗುರಿಗಳು, ಸಾಮರ್ಥ್ಯಗಳು ಮತ್ತು ಕಲಿಕಾಫಲಗಳ ಬಗ್ಗೆ ಸ್ಪಷ್ಟವಾಗಿ ಅರಿತುಕೊಳ್ಳಬೇಕು.
2. ಮಕ್ಕಳು ಆಯಾ ತರಗತಿ ಹಾಗೂ ವಿಷಯವಾರು ಸಾಧಿಸಬೇಕಾದ ಕಲಿಕಾಫಲಗಳಿಗೆ ಪೂರಕವಾಗಿ ಇಲ್ಲಿ ಚಟುವಟಿಕೆಗಳು ಹಾಗೂ ಪ್ರಶ್ನೆಗಳನ್ನು ನೀಡಲಾಗಿದೆ. ಶಿಕ್ಷಕರು ತಮ್ಮ ತರಗತಿ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಮಕ್ಕಳು ಕಲಿಕಾಫಲಗಳನ್ನು ಸಾಧಿಸಲು ಪೂರಕವಾಗಿ ಇವುಗಳನ್ನು ಸಂದರ್ಭೋಚಿತವಾಗಿ ಬಳಸುವುದು.
3. ತರಗತಿ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಹಂತ ಹಂತವಾಗಿ ಕಲಿಕಾಫಲ ಆಧಾರಿತ ಚಟುವಟಿಕೆಗಳನ್ನು ಬಳಸುವ ಮೂಲಕ ಮಕ್ಕಳನ್ನು ತೊಡಗಿಸಿಕೊಳ್ಳುವುದು ಹಾಗೂ ಮೌಲ್ಯಮಾಪನ ಪ್ರಕ್ರಿಯೆಯಲ್ಲಿ ಕಲಿಕಾಫಲ ಆಧಾರಿತ ಪ್ರಶ್ನಾಕೋರಿಯಲ್ಲಿ ನೀಡಿರುವ ಪ್ರಶ್ನೆಗಳನ್ನು ಅವಶ್ಯಕತೆಗಳಿಗನುಗುಣವಾಗಿ ಅಭ್ಯಾಸ ಮಾಡಿಸುವುದು.
4. ವಿದ್ಯಾರ್ಥಿಗಳ ಕಲಿಕಾ ಅಂತರವನ್ನು ಗುರುತಿಸಿ ಸೂಕ್ತ ಚಟುವಟಿಕೆಗಳನ್ನು ಕೈಗೊಳ್ಳುವ ಮೂಲಕ ತರಗತಿ ನಿರ್ದಿಷ್ಟ ಕಲಿಕೆಗೆ ಅಗತ್ಯ ಕ್ರಮವಹಿಸುವುದು.
5. ಪ್ರಶ್ನಾಕೋರಿಯು ಜ್ಞಾನ, ಗ್ರಹಿಕೆ, ಅನ್ವಯ, ಅಭಿವ್ಯಕ್ತಿ, ಪ್ರಶಂಸೆ, ವಿಮರ್ಶಾತ್ಮಕತೆ ಹಾಗೂ ಹೈಯರ್ ಆರ್ಡರ್ ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡಿದೆ. ಹೈಯರ್ ಆರ್ಡರ್ ಪ್ರಶ್ನೆಗಳು ಹೋಲಿಕೆ, ಸಾಮ್ಯತೆ ಮತ್ತು ವ್ಯತ್ಯಾಸ, ವಿಶ್ಲೇಷಣಾ ಸಾಮರ್ಥ್ಯ, ಮೌಲ್ಯಮಾಪನ ಮತ್ತು ಸೃಜನಶೀಲತೆಯಂತಹ ಆಯಾಮಗಳನ್ನು ಒಳಗೊಂಡಿರುತ್ತದೆ.
6. ಕೇವಲ ಅಂಕಗಳನ್ನು ನಮೂದಿಸುವುದಕ್ಕಾಗಿ, ಅಥವಾ ಪಠ್ಯವಸ್ತುವನ್ನು ಪೂರ್ಣಗೊಳಿಸುವುದಕ್ಕಾಗಿ ಕಲಿಕಾ ಫಲಾಧಾರಿತ ಮೌಲ್ಯಾಂಕನವನ್ನು ಜಾರಿಗೊಳಿಸದೇ, ವಿದ್ಯಾರ್ಥಿಗಳ ಸಾಮರ್ಥ್ಯ ವೃದ್ಧಿಗಾಗಿ ಹಾಗೂ ಕೌಶಲಗಳ ಪ್ರಾಪ್ತಿಗಾಗಿ ಕಲಿಕಾಫಲ ಆಧಾರಿತ ಮೌಲ್ಯಾಂಕನ ಪ್ರಶ್ನಾಕೋರಿಯನ್ನು ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಕೆ ಮಾಡುವುದು.
7. ಶಿಕ್ಷಕರು ಎಲ್ಲಾ ವಿಷಯಗಳಲ್ಲೂ ನಿಗದಿತ ಸಾಮರ್ಥ್ಯಗಳಿಸುವುದಕ್ಕಾಗಿ ಕಲಿಕಾನುಭವಗಳನ್ನು ನೀಡುವ ಹಾಗೂ ಮಕ್ಕಳ ಬೌದ್ಧಿಕ ಬೆಳವಣಿಗೆಗೆ ಸಹಕರಿಸುವ ನಿಟ್ಟಿನಲ್ಲಿ ಚಿಂತಿಸಿ ಈ ಶೈಕ್ಷಣಿಕ ಉಪಕ್ರಮವನ್ನು ಕಾರ್ಯಗತಗೊಳಿಸಬೇಕಿದೆ.
8. ಆಯಾಯ ತರಗತಿಯಲ್ಲಿ ಕಲಿಕೆಯನ್ನು ಅನುಕೂಲಿಸುತ್ತಿರುವ ವಿಷಯವಾರು ಶಿಕ್ಷಕರು ತಮ್ಮ ತಮ್ಮ ವಿಷಯಗಳ ಪ್ರಶ್ನಾಕೋರಿಯನ್ನು ಅರ್ಥಪೂರ್ಣವಾಗಿ ಬಳಸಿಕೊಂಡು ಮಕ್ಕಳಲ್ಲಿ ಅಪೇಕ್ಷಿತ ಕಲಿಕಾಫಲಗಳ ಸಾಧನೆಗಾಗಿ ಶ್ರಮಿಸುವುದು.
9. ಇಲಾಖೆಯ Website ನಲ್ಲಿ ಲಭ್ಯವಿರುವ ಕಲಿಕಾಫಲ ಆಧಾರಿತ ಮೌಲ್ಯಾಂಕನ ಪ್ರಶ್ನಾಕೋರಿಯನ್ನು ಕೂಲಂಕಷವಾಗಿ ಅವಲೋಕಿಸುವುದು ಹಾಗೂ ಅವುಗಳನ್ನು ಕಲಿಕೆಯಲ್ಲಿ ಪರಿಣಾಮಕಾರಿಯಾಗಿ ಬಳಸುವುದು.
10. ಪ್ರಶ್ನಾಕೋರಿಯನ್ನು ತರಗತಿ ಪ್ರಕ್ರಿಯೆ, ಮೌಲ್ಯಾಂಕನ, ಮೌಲ್ಯಮಾಪನ ಪ್ರಕ್ರಿಯೆಗಳಲ್ಲಿ ನಿರಂತರವಾಗಿ ಬಳಸುವುದು ಹಾಗೂ ಮಾಹಿತಿಯನ್ನು SATSನಲ್ಲಿ ಕಾಲಕಾಲಕ್ಕೆ ಇಂದೀಕರಿಸುವುದು.
11. LBA, ರೂಪಣಾತ್ಮಕ ಮೌಲ್ಯಾಂಕನ, ಸಂಕಲನಾತ್ಮಕ ಮೌಲ್ಯಮಾಪನ ಹಾಗೂ ಇತರೆ ಪರೀಕ್ಷೆಗಳಲ್ಲಿ, LBA ಯಲ್ಲಿರುವಂತೆ ಎಲ್ಲಾ ಸ್ವರೂಪದ ಪ್ರಶ್ನೆಗಳನ್ನು ಒಳಗೊಂಡ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ ಸಿದ್ಧಪಡಿಸುವುದು ಹಾಗೂ ವಿಶ್ಲೇಷಣಾ ವರದಿಯನ್ನು ಆಧರಿಸಿ ಪರಿಹಾರಾತ್ಮಕ ಕ್ರಮಗಳನ್ನು ಕೈಗೊಳ್ಳುವುದು.
12. ಪ್ರಶ್ನಾಕೋರಿಯಲ್ಲಿರುವ ಉತ್ತರ ಕೀಲಿಯನ್ನು ವಿಷಯ ಶಿಕ್ಷಕರು ಒಮ್ಮೆ ಅವಲೋಕಿಸಿ, ಖಚಿತಪಡಿಸಿಕೊಂಡು ವಿದ್ಯಾರ್ಥಿಗಳಿಗೆ ಅನುಕೂಲವಾಗುವಂತೆ ಅಪೇಕ್ಷಿತ ಉತ್ತರಗಳನ್ನು ಒದಗಿಸುವುದು.

## List of Learning Outcomes

| <b>Curricular goals</b>                                                        | <b>Competencies</b>                                                                                                                                                                                                                                                                                           | <b>Learning Outcomes</b>                                                                                                                                                                                                                             | <b>Corresponding Lesson Name</b>                                         |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1.Explores the world of matter and its constituents, properties, and behaviour | <b>C-1.1</b> -Classifies matter based on observable physical characteristics (solid, liquid, gas, shape, volume, density, transparent, opaque, translucent, magnetic, non-magnetic, conducting, non-conducting) and chemical characteristics (pure, impure; acid, base; metal, non-metal; element, compound). | The learners will,<br><br>1. Identify and classify the materials as elements, compounds and mixtures with reference to their properties and composition.                                                                                             | <b>Chapter 8: Nature of Matter – Elements, Compounds and Mixtures</b>    |
|                                                                                | <b>C-1.2</b> - Describes physical and chemical changes in matter and uses the particulate nature of matter to explain its properties and transformations.                                                                                                                                                     | 2. <i>Understand and explains the concepts of physical and chemical changes in matter, properties and its transformations; apply their uses in everyday situations</i>                                                                               | <b>Chapter 7 Particulate nature of matter</b>                            |
|                                                                                | <b>C-1.3</b> Explains the importance of measurement and measures physical properties of matter (volume, weight, temperature, density) using indigenous, non-standard, and standard units with simple instruments.                                                                                             | 3. Understand and define the concepts of solubility, purity, concentration and determine the effects of temperature on them.                                                                                                                         | <b>Chapter 9: The Wonderful World of Solutes, Solvents and Solutions</b> |
|                                                                                | <b>C-1.4</b> - Observes and explains phenomena caused by differences in pressure, temperature, and density, such as breathing, sinking and floating, water pumps, cooling processes, and wind formation.                                                                                                      | 4. Understand and explain the relationship between pressure, atmospheric pressure and the movement of air.<br><br>5. Explain the causes and effects of thunder, lightning and cyclones with the safety measures to be taken during their occurrence. | <b>Chapter 6: Pressure, Winds, Storms and Cyclones</b>                   |

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| 2. Explores the physical world in scientific and mathematical terms. | <b>C-2.1</b> -Describes one-dimensional motion (uniform, non-uniform, horizontal, vertical) using measurements of position, speed, and changes in speed through mathematical and diagrammatic representations.          | 6. Explain the concept of force and its types, weight, mass and buoyant force with examples; differentiates between them.                                                                                                                                                                     | <b>Chapter 5: Exploring Forces</b>                                    |
|                                                                      | <b>C-2.2</b> -Explains how electricity works by manipulating components in simple circuits and demonstrates the heating and magnetic effects of electricity.                                                            | 7. Understand the magnetic and heating effects of electric current with suitable examples; define cell, voltaic cell, dry cell, battery and explain their working and uses.                                                                                                                   | <b>Chapter 4: Electricity – Magnetic and Heating Effects</b>          |
|                                                                      | <b>C-2.3</b> -Describes the properties of natural and artificial magnets and explains the Earth as a magnet.                                                                                                            |                                                                                                                                                                                                                                                                                               |                                                                       |
|                                                                      | <b>C-2.4</b> -Demonstrates rectilinear propagation of light from natural and artificial sources and reflecting surfaces; verifies the laws of reflection using mirrors, pinhole cameras, kaleidoscopes, and periscopes. | 8. State the laws of reflection; Identify angle of incidence and angle of reflection; differentiate between converging and diverging mirrors; recall the uses of mirrors to day to day life; Define mirrors and lenses; differentiate between types of lenses and mention the uses of lenses. | <b>Chapter 10: Light – Mirrors and Lenses</b>                         |
|                                                                      | <b>C-2.5</b> -Observes and identifies celestial objects such as stars, planets, satellites, constellations, and comets, and explains their role in navigation, calendars, moon phases, eclipses, and life on Earth.     | 9. Identify the different phases of the Moon and Explains the features of different calendars (lunar, solar, and lunisolar) based on the periodic cycles.<br>10. Explain the uses and importance of artificial satellites in understanding features beyond the earth.                         | <b>Chapter 11: The Celestial Clock</b>                                |
| <b>3. Explores the living world in scientific terms.</b>             | <b>C-3.1</b> Describes the diversity of living organisms in natural surroundings, including insects, earthworms, snails, birds, mammals, reptiles, spiders, plants, fungi, and microscopic organisms.                   | 11. Define microorganisms and list its types with examples; Explain the role of microorganisms in the field of Industries, agriculture, health and medicines in daily life; Elicit the role of microorganisms in order to bring a balance in the environment.                                 | <b>Chapter 2: The Invisible World of Life – Beyond Our Naked Eyes</b> |

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|                                                                          | <b>C-3.2</b> Distinguishes living organisms from non-living things based on characteristics such as nutrition, growth, respiration, response to stimuli, reproduction, excretion, and cellular organization. |                                                                                                                                                                                                                                                                                                                                          |                                                                                        |
|                                                                          | <b>C-3.3</b> Analyses relationships between living organisms and their environment, highlights the interdependencies and responses to their environmental factors.                                           | <i>12.</i> Identify the components of environment and analyze the inter relationship between these components with particular illustrations; Integrate the importance of formation of food chains and food webs in the ecosystem to bring sustainability in the environment. Define and explain the biological terms related to ecology. | <b>Chapter 12: How Nature Works in Harmony</b>                                         |
|                                                                          | <b>C-3.4</b> -Explains the conditions necessary to sustain life on the Earth and other planets, including atmosphere, suitable temperature and pressure, light, and water properties.                        | <i>13.</i> Explain the special features of the Earth that support life in the different layers of the Earth (atmosphere, hydrosphere, lithosphere and biosphere) and their interrelationships.<br><i>14.</i> Explain the types of reproduction; the importance of biodiversity; the challenges faced by life on Earth.                   | <b>Chapter 13: Our Home – Earth, a Unique Planet that Nurtures Life and Ecosystems</b> |
| <b>4. Understands the components of health, hygiene, and well-being.</b> | <b>C-4.1</b> -Analyses food components with reference to Indian culinary practices and modern nutrition, and explains the effects of nutrition on health.                                                    | <i>15.</i> Understand the concept of health and Identify diseases and their causes.<br><i>16.</i> Explain the importance of prevention which is better than cure in health management.                                                                                                                                                   | <b>Chapter 3: Health – A Precious Treasure</b>                                         |
|                                                                          | <b>C-4.2</b> -Examines the diversity of food sources, nutrients, climatic conditions and dietary practices.                                                                                                  |                                                                                                                                                                                                                                                                                                                                          | <b>All Lessons</b>                                                                     |
|                                                                          | <b>C-4.3</b> -Describes biological changes during adolescence, including growth and hormonal changes, and measures to be taken/followed for overall well-being.                                              |                                                                                                                                                                                                                                                                                                                                          |                                                                                        |

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|                                                                                                                                                       | <b>C-4.4</b> -Recognizes and discusses substance abuse and views the school as a safe environment for raising such concerns.                                                                                                                                                                |                                                                                                                                                                                                                                                                      |                                                         |
| <b>5. Understands the interface of Science, Technology, and Society.</b>                                                                              | <b>C-5.1</b> -Illustrates how Science and Technology improve human life in areas such as healthcare, communication, transportation, food security, climate change mitigation, resource conservation, and satellite applications, while also recognizing harmful uses of science in history. | 17. Observe events and objects in daily life and exhibit curiosity about the natural world and display interest in learning new things.<br>18. Formulate simple questions based on scientific observations and make attempt to investigate and find answers to them. | <b>Chapter 1: A Science Explorer Explores the World</b> |
|                                                                                                                                                       | <b>C-5.2</b> -Shares and discusses views on news and articles related to the mutual impact of Science, Technology, and society.                                                                                                                                                             |                                                                                                                                                                                                                                                                      | <b>All Lessons</b>                                      |
| <b>6. Explores the nature and processes of Science through engaging with the evolution of scientific knowledge and conducting scientific inquiry.</b> | <b>C-6.1</b> -Illustrates how scientific knowledge and ideas have evolved over time and identifies scientific values such as scientific temper, collaboration, and conservation of biodiversity and ecosystems.                                                                             |                                                                                                                                                                                                                                                                      |                                                         |
|                                                                                                                                                       | <b>C-6.2</b> -Formulates scientific questions, identifies possible causes and patterns, and collects evidence through observation, simple experiments, and scientific instruments.                                                                                                          |                                                                                                                                                                                                                                                                      |                                                         |
| <b>7. Communicates questions, observations, and conclusions related to Science.</b>                                                                   | <b>C-7.1</b> -Uses scientific vocabulary accurately in oral, written, and visual forms of communication.                                                                                                                                                                                    |                                                                                                                                                                                                                                                                      |                                                         |
|                                                                                                                                                       | <b>C-7.2</b> -Designs and builds simple models to demonstrate scientific concepts.                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                      |                                                         |
|                                                                                                                                                       | <b>C-7.3</b> -Represents real-world events and relationships using                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                      |                                                         |

|                                                                                                                                                                                                                               |                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                               | diagrams and simple mathematical representations.                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <b>8. Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it.</b>                                          | <b>C-8.1</b> -Explains the significant contributions of India to scientific concepts, explanations, methods, and discoveries integrated within the curriculum.   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <b>Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving and that there are still many unanswered questions.</b> | <b>C-9.1</b> -States concepts that reflect the current scientific understanding of the topics being studied, appropriate to the developmental stage of learners. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|                                                                                                                                                                                                                               | <b>C-9.2</b> -Identifies and states questions within the curriculum for which current scientific understanding remains incomplete or inadequate.                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|                                                                                                                                                                                                                               |                                                                                                                                                                  | <p>19. Draw the diagram with labeling,</p> <ul style="list-style-type: none"> <li>- To show reflection of the light rays in mirrors, different lenses, simple circuits, voltaic cell, phases of moon, <i>Voltammeters</i>; and apparatus involved different experiments and also conducting experiments.</li> <li>- Plant cell, animal cell, neurons, flower, formation of zygote, structure of different microorganisms with a few labels. Draw the food chains and food web that exists in a given type of <i>ecosystem</i> .</li> </ul> |  |

## Index

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**Lesson: 1**  
**Exploring investigative world of science**

| <b>LO Number</b> | <b>Learning outcome</b>                                                                                                             | <b>Question number</b>                                            |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 17               | Observe events and objects in daily life and exhibit curiosity about the natural world and display interest in learning new things. | 1,2,4,5,6,8,10,12,13,16,18,19,21,24,25,26,29,30,31,32,34,37,38,42 |
| 18               | Formulate simple questions based on scientific observations and make attempt to investigate and find answers to them                | 3,7,9,11,14,15,17,20,22,23,27,28,33,35,3639,40,41.                |

**Distribution of questions based on difficulty**

| <b>Question type</b>   | <b>Easy</b> | <b>Average</b> | <b>Difficult</b> | <b>Total</b> |
|------------------------|-------------|----------------|------------------|--------------|
| Multiple choice (1m)   | 04          | 04             | 04               | 12           |
| Very short answer (1m) | 04          | 05             | 03               | 12           |
| Short answer (2m)      | 05          | 04             | 04               | 13           |
| Long answer (3m)       | 02          | 02             | 01               | 05           |
| Long answer (4m)       | -           | -              | -                | -            |
| Long answer (5m)       | -           | -              | -                | -            |
| Total                  | 15          | 15             | 12               | 42           |

**Distribution of questions based on objectives**

| <b>Question type</b>   | <b>Knowledge</b> | <b>Understanding</b> | <b>Application</b> | <b>Skill</b> | <b>Total</b> |
|------------------------|------------------|----------------------|--------------------|--------------|--------------|
| Multiple choice (1m)   | 05               | 04                   | 03                 | -            | 12           |
| Very short answer (1m) | 04               | 05                   | 03                 | -            | 12           |
| Short answer (2m)      | 05               | 03                   | 05                 | -            | 13           |
| Long answer (3m)       | 02               | 02                   | 01                 | -            | 05           |
| Long answer (4m)       | -                | -                    | -                  | -            | -            |
| Long answer (5m)       | -                | -                    | -                  | -            | -            |
| Total                  | 16               | 14                   | 12                 | -            | 42           |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. Every matter around us is made up of.  
A) Compounds      B) Mixtures      C) Colloid      D) Tiny-particles
2. The state of matter in which particles move freely is:  
A) Solid      B) Liquid      C) Gas      D) Solid and Liquid
3. Substances that can be physically separated are called:  
A) Compounds      B) Elements      C) Atoms      D) Mixtures.
4. The phenomenon of bending of a ray of light when it travels from one medium to another is called:  
A) Reflection of light      B) Dispersion of light  
C) Refraction of light      D) Reunion of light
5. The instrument used to observe microorganisms is:  
A) Microscope      B) Mirror      C) Telescope      D) Thermometer
6. The force with which the Earth pulls objects towards itself is:  
A) Muscular force      B) Magnetic force  
C) Gravitational force      D) Electrostatic force
7. An example of the magnetic effect of electric current is:  
A) Bulb      B) Electric Motor      C) Iron box      D) Toaster
8. An example of the heating effect of electric current is:  
A) Television      B) Refrigerator      C) Water Heater      D) Washing machine
9. The chemicals used to keep our body healthy and fight against diseases are:  
A) Food      B) Vaccine      C) Water      D) Vegetables
10. Harmful microorganisms cause \_\_\_\_\_.  
A) Infection      B) Diabetes      C) Blood pressure      D) Good health
11. This is the main reason for major weather events like cyclones:  
A) Small difference in pressure      B) Strong difference in pressure  
C) Constant pressure with no change      D) No change in force.

12. The key factor responsible for weather phenomena like gentle breeze is:

- A) Small difference in pressure
- B) Strong difference in pressure
- C) Constant pressure with no change
- D) No change in force

**II. Answer the following questions. (One-Mark)**

- 13. What are microorganisms?
- 14. Mention one application of the magnetic effect of electric current.
- 15. Name two devices that operate on the heating effect of electric current.
- 16. What is the reason for a ball thrown up in the air falls back to the ground?
- 17. Which factor is responsible for the weather events like storms and cyclones?
- 18. Mention the effects caused by differences in atmospheric pressure.
- 19. How are solutions formed?
- 20. On what basis did early humans design first traditional (Panchanga) calendars?
- 21. What is biodiversity?
- 22. Which atmospheric layer protects us from harmful ultraviolet (UV) rays?
- 23. What causes a puri to puffs up when fried in hot oil?
- 24. What is the refraction of light

**III. Answer the following questions. (Two-Mark ):**

- 25. List out the advantages or benefits of microorganisms.
- 26. Write down the harmful effects or disadvantages caused by microorganisms.
- 27. Mention the essential factors required to maintain good health and well-being.
- 28. What are the key factors involved in the prevention of infections?
- 29. Write two advantages or applications of the heating effect of electric current.
- 30. Write down the properties of matter in a solid state.
- 31. Write the differences between the solid state and the gaseous state of matter.
- 32. How are molecules arranged in liquid state of matter?
- 33. How can we classify the materials and substances present around us?
- 34. How are elements different from compounds?
- 35. What is the cause behind the occurrence of the periodic cycles of Moon's phases?
- 36. What is the primary function of a vaccine?
- 37. Why water boils at a specific temperature?

**IV. Answer the following questions. (Three-Mark )**

- 38. Write down the factors that help in the formation of ecosystems.
- 39. List the changes faced by the Earth due to human activities.
- 40. Which scientific principles help to maintain the delicate ecological balance of life on Earth?
- 41. Mention the factors that help in enhance the scientific attitude in children
- 42. Define the following terms:
  - (i) Elements
  - (ii) Compounds
  - (iii) Mixtures.

## CHAPTER 2

### THE INVISIBLE LIVING WORLD : BEYOND OUR NAKED EYE.

| LO Number | Learning outcome                                                                                                                                                                                                                                          | Question number |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>11</b> | Define microorganisms and list its types with examples; Explain the role of microorganisms in the field of Industries, agriculture, health and medicines in daily life; Elicit the role of microorganisms in order to bring a balance in the environment. | <b>1 to 66</b>  |

#### Distribution of questions based on difficulty

| Question type          | Easy | Average | Difficult | Total |
|------------------------|------|---------|-----------|-------|
| Multiple choice (1m)   | 05   | 08      | 04        | 17    |
| Very short answer (1m) | 06   | 08      | 01        | 15    |
| Short answer (2m)      | 01   | 11      | 05        | 17    |
| Long answer (3m)       | -    | 01      | 09        | 10    |
| Long answer (4m)       | -    | -       | 04        | 04    |
| Long answer (5m)       | -    | -       | 03        | 03    |
| Total                  | 12   | 28      | 26        | 66    |

#### Distribution of questions based on objectives

| Question type          | Knowledge | Understanding | Application | Skill | Total |
|------------------------|-----------|---------------|-------------|-------|-------|
| Multiple choice (1m)   | 06        | 05            | 06          | -     | 17    |
| Very short answer (1m) | 05        | 06            | 04          | -     | 15    |
| Short answer (2m)      | 06        | 05            | 04          | 02    | 17    |
| Long answer (3m)       | 04        | 03            | 03          | -     | 10    |
| Long answer (4m)       | 01        | 02            | 01          | -     | 04    |
| Long answer (5m)       | 01        | 01            | 01          | -     | 03    |
| Total                  | 23        | 22            | 19          | 02    | 66    |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. A device that helps humans see what the naked eye cannot see is, (easy)

- A ) Lens
- B) Microscope
- C) Mirror
- D) slide

2. Living things that cannot be seen with the naked eye are called (average)

- A) Plants
- B) Animals
- C) Microorganisms
- D) Aquatic animals

3. A cell organelle found only in plant cells is (average)

- A ) Plastid
- B) Mitochondria
- C ) Golgi complex
- D ) Ribosome

4. Tissue that carries messages in our body (average)

- A ) Muscle tissue
- B ) Nerve cell
- C ) Blood
- D ) Bone

5. The life of complex organisms begins with this (difficult)

- A ) Egg
- B ) Cell
- C ) Muscle
- D ) Organ

6. Organisms that cannot be seen with the naked eye in the colloidal mixture of soil is (average)

- A ) Earthworm
- B ) Microorganism

C ) Leech

D ) Snake

7. A single-celled organism with an irregular shape (easy)

A ) Amoeba

B) Algae

C) Paramecium

D) Bacteria

8. A single - celled organism that has a green pigment (difficult)

A) Bacteria

B) Amoeba

C ) Algae

D) Paramoecium

9. A microscopic organism with a brush-like structure of filaments that lack chlorophyll is (easy)

A) Amoeba

B) Algae

C) Paramoecium

D) Bacteria

10. organism which has a small sac-like structure without chlorophyll is (average)

A ) Bacteria

B ) Amoeba

C ) Algae

D ) Fungus

11. An organism that increases its number only when it enters a living cell is (average)

A ) Bacteria

B ) Amoeba

C ) Virus

D ) Algae.

12. Microorganisms that clean the environment is (easy)

A) Amoeba

B)Algae

C ) Bacteria and fungi

D) Yeast

13. Biogas among the following is (difficult)

A) Methane

B) Ethane

C) Petrol

D) Diesel

14. Microorganism found in the roots of leguminous plants is (average)

A) Algae

B) Amoeba

C) Rhizobium

D) Yeast

15. The form of vitamin B-12 that is essential for our body is (average)

A) Mould

B) Spirulina

C) Amoeba

D) Paramecium

16. An electron microscope magnifies a cell to this extent. (difficult)

A) 100 times

B) 1000 times

C) 1,00,000 times

D) 10,00,000 times

17. Bacteria that curdle milk is (easy)

A) Lactobacillus

B) Yeast

C) Amoeba

D) Fungus

## **II. Answer the following questions. (One-Mark )**

18. What are organisms? (easy)

19. What substance is used to prevent cells from drying out in the laboratory? (average)

20. Define a cell. (easy)

21. What type of structures are the cells in our cheeks? (average)

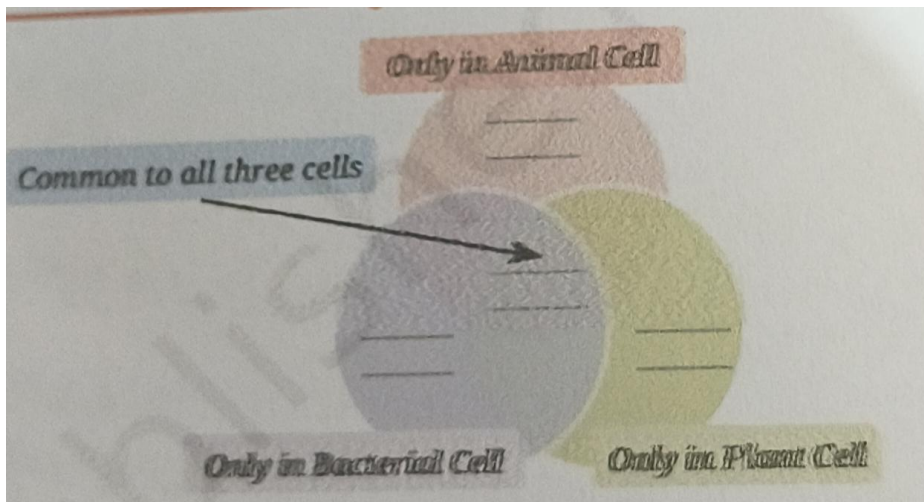
22. What are the three layers of cells? (average)
23. What is the function of the nucleus in a cell? (average)
24. Which part of the cell provides strength and energy to plant cells? (easy)
25. What is the function of neurons? (easy)
26. Why are the food vacuoles in plant cells larger than in animal cells? (average)
27. What are microorganisms? (easy)
28. Which organisms are called unicellular organisms? (average)
29. Name the decomposers in the environment. (easy)
30. Which biogas is produced with the help of microorganisms? (average)
31. What are the uses of biogas? (average)
32. Explain the structure of bacteria. (difficult)

### III . Answer the following questions. (Two-Mark )

33. Explain the structure of a cell. (Average)
34. What is the function of cell membrane? (average)
35. What compounds does the cell membrane contain and what is its function? (difficult)
36. Name the different cells in humans. (average)
37. State the difference between muscle cells and neurons. (difficult)
38. Draw a picture of a neuron. (average)
39. What is tissue? (easy)
40. State the levels of organization of the body of an organism. (average)
41. Man is a multicellular organism. Justify this statement. (average)
42. Draw a diagram of a plant cell and identify the parts. (average)
43. Name the groups of microorganisms. (average)
44. Tomatoes and oranges are left outside for a few days, cotton threads -like growths can be seen. What could be this cotton-like structure? (difficult)
45. What are the organisms found in the colloidal mixture of soil? (average)
46. What are the differences between bacteria and fungi? (average)
47. What are the differences between unicellular and multicellular organisms? (average)
48. Illustrate an experiment to test the need for appropriate temperature, air, and humidity for the growth of microorganisms. (difficult)
49. The curd becomes more sour when left out for a day without being used. Give two possible explanations for this observation. (difficult)

#### IV . Answer the following questions. (Three-Mark)

50. How are microorganisms helpful in food production? (difficult)
51. How can a cell be observed using onion peel? (difficult)
52. How are plant cells different from animal cells? (difficult)
53. How do cells in plants and animals differ and have similarities functionally and structurally? (difficult)
54. Explain the process of transporting food from the alimentary canal to the stomach in the digestive system. (difficult)
55. Explain what would happen if there were no microorganisms on Earth? (difficult)
56. Microorganisms play an important role in biogas production. Justify with suitable reasons. (difficult)
57. Identify the following microorganisms (average)
- (A) I live in all kinds of environments and even inside your intestines.
- (B) I make bread and cakes soft and spongy.
- (C) I live in the roots of legumes and provide nutrients for their growth-
58. Various parts of a cell are given below .write them in the appropriate places in the following diagram.. (difficult)



- A) Nucleus B) Chloroplast
- C) Cell membrane D) cytoplasm
- E) Cell wall F) Nucleoid

59. Take two pieces of bread. Take one piece on a plate and place it near the sink and keep the other piece in the refrigerator. Think about the changes occurs after three days and give suitable reasons for the changes.. (difficult)

#### V. Answer the following questions (Four Mark)

60. Explain the role of microorganisms in cleaning the environment. (difficult)

61. Yeast is used in the preparation of bakery products. What are the benefits of using it? (difficult)

62. Complete this table. (difficult)

|                                                        | Name of the microorganism | Task |
|--------------------------------------------------------|---------------------------|------|
| Organism in yogurt                                     |                           |      |
| Microorganism found in the roots of legume plants      |                           |      |
| An organism used in the preparation of bakery products |                           |      |
| Decomposers in the environment                         |                           |      |

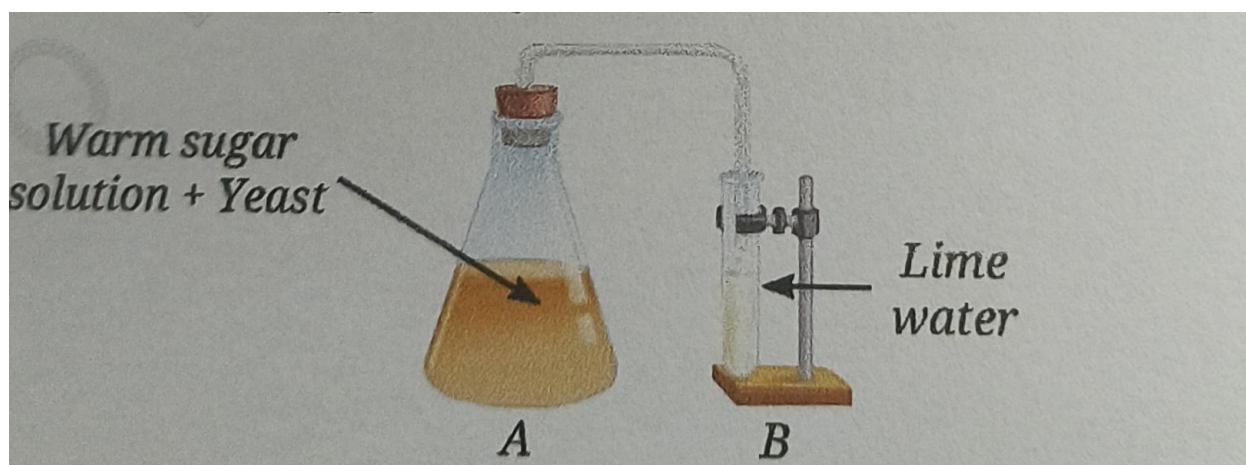
63. Take luke warm milk in bowl A and cold milk in bowl B. Now add one small spoon of curd to each bowl and mix well with a spoon. Cover both the bowls and keep bowl A in a warm place, bowl B in a cool place like the refrigerator overnight. In which of these two bowls curd forms? justify your answer. (different)

#### VI . Answer the following questions (Five mark)

64.Explain the method of preparation of organic fertilizer.(difficult)

65. Observe the experimental setup given in Figure 2.15 and answer the following questions.

(difficult)



A) What happens to the sugar solution in flask A?

B) What do you observe in test tube B after four hours? Why do you think this happened?

C) What would happen if yeast was not added to flask A?

66. Name the organisms in the soil admixture and describe their structure. (difficult)

**CHAPTER 3.**  
**Health: The Ultimate Treasure.**

| <b>LO Number</b> | <b>Learning outcome</b>                                                             | <b>Question number</b>                                                                                                          |
|------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 15               | Understand the concept of health and Identify diseases and their causes.            | 1,3,4,5,7,8,9,11,13,14,15,16,18,19,21,22,23,26,27,28,29,33,36,37,38,40,41,47,48,49,51,54,55,56,58,59,62,63,65,69,70,71,72,74,77 |
| 16               | Explain the importance of prevention which is better than cure in health management | 2,6,10,12,17,20,24,25,30,31,32,34,35,39,42,43,44,45,46,50,52,53,57,60,61,64,66,67,68,73,75,78,79,80                             |

**Distribution of questions based on difficulty**

| <b>Question type</b>   | <b>Easy</b> | <b>Average</b> | <b>Difficult</b> | <b>Total</b> |
|------------------------|-------------|----------------|------------------|--------------|
| Multiple choice (1m)   | 07          | 06             | 07               | 20           |
| Very short answer (1m) | 07          | 07             | 05               | 19           |
| Short answer (2m)      | 08          | 10             | 06               | 24           |
| Long answer (3m)       | 02          | 02             | 02               | 06           |
| Long answer (4m)       | 01          | 03             | 03               | 07           |
| Long answer (5m)       | 01          | 02             | 01               | 04           |
| Total                  | 26          | 30             | 24               | 80           |

**Distribution of questions based on objectives**

| <b>Question type</b>   | <b>Knowledge</b> | <b>Understanding</b> | <b>Application</b> | <b>Skill</b> | <b>Total</b> |
|------------------------|------------------|----------------------|--------------------|--------------|--------------|
| Multiple choice (1m)   | 07               | 06                   | 07                 | -            | 20           |
| Very short answer (1m) | 07               | 07                   | 05                 | -            | 19           |
| Short answer (2m)      | 10               | 06                   | 07                 | 01           | 24           |
| Long answer (3m)       | 02               | 02                   | 02                 | -            | 06           |
| Long answer (4m)       | 02               | 02                   | 02                 | 01           | 07           |
| Long answer (5m)       | 01               | 01                   | 01                 | 01           | 04           |
| Total                  | 29               | 24                   | 24                 | 03           | 80           |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. According to Ayurveda, health means:  
A) Free from disease  
B) Balance between body, mind, and the surroundings.  
C) Being physically energetic  
D) Maintaining zero disease
2. This factor helps the body and mind to get rest and recover  
A) Doing less work  
B) Getting adequate sleep  
C) Eating fruits  
D) Eating different types of grains
3. The factor that is helpful to know how clean the air is  
A) BOD  
B) HIV  
C) AQI  
D) AIQ
4. Identify the non-communicable disease:  
A) Cancer  
B) Typhoid  
C) Tuberculosis  
D) Cholera
5. Identify the communicable disease in the following  
A) Malaria  
B) Diabetes  
C) Blood Pressure  
D) Cancer
6. The disease causes diarrhea and dehydration is  
A) Chickenpox  
B) Cholera  
C) Measles  
D) Influenza
7. In the following this disease is caused by bacteria  
A) Measles  
B) Chickenpox  
C) Hepatitis  
D) Tuberculosis
8. This part of the body is affected by the Hepatitis-A infection  
A) Skin  
B) Kidney  
C) Liver  
D) Lungs
9. This country has the highest number of diabetic patients in the world.  
A) China  
B) India  
C) Sri Lanka  
D) America
10. An infectious mild natured disease found in cattle of the following is  
A) Cowpox  
B) Foot-and-mouth disease  
C) Anthrax  
D) Tuberculosis
11. The part of the body is infected by the pathogen that causes Cholera.  
A) Lungs  
B) Intestine  
C) Heart  
D) Skin

12. The disease is related to the lungs is
- A) Cholera              B) Typhoid              C) Tuberculosis              D) Hepatitis
13. The disease caused by a protozoa
- A) Dengue              B) Measles              C) Malaria              D) Common cold
14. The scientist responsible for discovery of the vaccine for Smallpox.
- A) Edward Jenner B) Alexander Fleming C) Robert Koch              D) Louis Pasteur
15. The scientist associated with the development of the Rota virus vaccine was
- A) Edward Jenner B) Dr. Maharaj Kishan              C) Robert Koch              D) Alexander
16. The vaccine which protects children from diarrhea.
- A) Rotavirus              B) Adenovirus              C) Hepatitis-A              D) Bacillus bacteria
17. Antibiotics formed from these microbes do not work against diseases.
- A) Bacteria & Virus                              B) Protozoa and Virus  
C) Protozoa and Fungi                              D) Virus and Fungi
18. The scientist who discovered Penicillin.
- A) Alexander Fleming                              B) Dr Kishan Bhan  
C) Robert Koch                              D) Edward Jenner
19. Penicillin was discovered in the year
- A) 1928              B) 1828                              C) 1830                              D) 1918
20. Penicillin is produced from of the following organism.
- A) Bacteria              B) Fungi                              C) Virus                              D) Protozoa

## II. Answer the following questions. (One-Mark )

21. What is health?
22. Expand WHO.
23. Mention the symptom of fever.
24. Expand AQI.
25. What are the external visible signs that indicate disease?
26. What are pathogens?
27. Write down the types of diseases.
28. What are non-communicable diseases?
29. Give two examples of non-communicable diseases.
30. Insects are called as disease vectors. Give reason.

31. What are parasitic organisms?
32. Give two examples of chronic diseases.
33. What is immunity?
34. What is the most effective way to protect against serious illnesses?
35. What is the main point that should always be remembered about vaccines?
36. Write the advantages of Rota virus in children.
37. What is the use of Penicillin?
38. What is antibiotic resistance?
39. Mention the achievement of Dr. Kamal Ranadive.

### **III. Answer the following questions. (Two-Mark )**

40. What are the factors that affect on health?
41. Mention the habits that are not good for the health.
42. Under what circumstances do people living in playground may fall sick more often?
43. Name the health problems caused by air pollution.
44. Antibiotics work only against bacterial infections. Why?
45. Write down the factors that help keep our mind healthy.
46. What are the signs expressed by the body during illness?
47. Name the organisms that cause diseases in human.
48. What are communicable diseases? Give examples.
49. Classify the following into communicable and non-communicable diseases:  
Cancer, Typhoid, Asthma, Diabetes, Dengue, Covid-19. Chicken pox, Flue.
50. What is the reason for non-communicable diseases being common in India?
51. Mention the differences between communicable and non-communicable diseases.
52. What are the precautionary measures taken to prevent Cholera?
53. Mention the pathogens that cause the following diseases:  
A) Malaria  
B) Filariasis
54. What are deficiency diseases? Give examples.
55. Mention the reasons for Diabetes disease in human.
56. List the symptoms of Diabetes disease.
57. How does a vaccine work in our body?
58. How are vaccines prepared?
59. How does the Tetanus injection works in our body?
60. How does the antibiotic resistance found in domestic animals transfer to the  
Human community?
61. Is it appropriate to give antibiotics to cattle? Justify your answer.
62. Name the traditional systems of medicine existing in India.
63. List the uses and advantages of vaccines.

### **IV. Answer the following questions. (Three-Mark )**

64. List the daily routine practices to be followed to maintain good health.
65. Mention the methods or ways to maintain a healthy lifestyle?
66. How are communicable diseases spread? Explain.
67. Explain the variolation traditional method to protect against small pox..
68. How did bacteria become resistant to antibiotics? Explain.

69. What are the precautionary measures that can be taken to reduce antibiotic resistance?

**V. Answer the following questions. (Four-Mark Questions)**

70. Complete the following table:

| Disease      | Pathogen | Site of infection |
|--------------|----------|-------------------|
| Common Cold  |          |                   |
| Tuberculosis |          |                   |

71. Complete the following table:

| Disease | Pathogen | Site of infection |
|---------|----------|-------------------|
| Measles |          |                   |
| Cholera |          |                   |

72. Complete the following table:

| Disease       | Pathogen | Site of infection |
|---------------|----------|-------------------|
| Hepatitis – A |          |                   |
| Typhoid       |          |                   |

73. Write down the precautionary measures to prevent the spread of communicable diseases.

74. How does antibiotic resistance spread in a community?

75. Complete the following table:

| Disease      | Symptoms |
|--------------|----------|
| Influenza    |          |
| Tuberculosis |          |

76. Complete the following table:

| Disease | Symptoms |
|---------|----------|
| Cholera |          |
| Malaria |          |

**VI. Answer the following questions. (Five-Mark )**

77. In the table given below contains information about the number of dengue cases monthly reported in a hospital.

|     |     |     |       |     |      |      |        |           |         |
|-----|-----|-----|-------|-----|------|------|--------|-----------|---------|
| Jan | Feb | Mar | April | May | June | July | august | september | october |
| 10  | 12  | 15  | 18    | 22  | 40   | 65   | 65     | 65        | 30      |

a) In which month's dengue cases highest ?

b) Mention the reasons responsible for highest cases in those months?

78. What are the key messages to reduce communicable and non communicable diseases in school health campaign?

79. What are the precautions should you take during trip to another city where malaria is prevalent?

80. Smoking can seriously harm to health, Justify.

## CHAPTER- 4

### Electricity: Magnetic and Heating Effects.

| LO number | Learning outcome                                                                                                                                                         | Question number |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 7         | Understand the magnetic and heating effects of electric current with suitable examples; define cell, voltaic cell, dry cell, battery and explain their working and uses. | 1 to 85         |

### Distribution of questions based on Difficulty

| Question type            | Easy | Average | Difficult | Total |
|--------------------------|------|---------|-----------|-------|
| Multiple Choice<br>(1 m) | 14   | 12      | 02        | 28    |
| Very Short Answer (1m)   | 10   | 12      | 01        | 23    |
| Short Answer (2m)        | 06   | 10      | 09        | 25    |
| Long Answer ((3m)        | -    | 01      | 03        | 04    |
| Long Answer (2m)         | -    | 02      | 01        | 03    |
| Long answer (3m)         | 01   | 01      | -         | 02    |
| Total                    | 31   | 38      | 16        | 85    |

### Disribution of Questions Based on Objectives

| Question type          | Knowledge | Understanding | Application | Skill | Total |
|------------------------|-----------|---------------|-------------|-------|-------|
| Multiple Choice(1m)    | 14        | 10            | 04          | -     | 28    |
| Very short answer (1m) | 10        | 12            | 01          | -     | 23    |
| Short Answer(2m)       | 08        | 10            | 06          | 01    | 25    |
| Long Answer(3m)        | -         | 02            | 02          | -     | 04    |
| Long Answer(4m)        | -         | 01            | -           | 02    | 03    |
| Long Answer(5m)        | 01        | -             | 01          | -     | 02    |
| Total                  | 33        | 35            | 14          | 03    | 85    |

## I.

**Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. When an electric current flows through a wire, the following effect occurs

- A. The wire undergoes a chemical change **(Easy)**
- B. A magnetic field is produced around the wire.
- C. The wire cools.
- D. The wire becomes a permanent magnet.

2. The scientist who discover the magnetic effect of electric current first is **(Easy)**

- A. Thomas Alva Edison
- B. Michael Faraday
- C. Hans Christian Oersted
- D. Alexander Graham Bell

3. The device which works on the principle of magnetic effect of electric current is

- A. Electric bell **(Average)**
- B. Electric iron box
- C. Electric bulb
- D. Electric kettle

4. Electromagnet is a **(Easy)**

- A. Permanent magnet
- B. Temporary magnet
- C. Bar magnet
- D. Magnetic needle

5. Generally, this metal is used as the core of an electromagnet **(Easy)**

- A. Copper
- B. Alumenium
- C. Soft iron
- D. Silver

6. A method used to make a circular electric coil stronger is **(Average)**

- A. Reducing the current
- B. Reducing the number of turns of the coil
- C. Installing an electric bulb

D Placing soft iron nail in the centre of the coil

7. An electric device used to break an electric circuit is **(Easy)**

- A. Connecting wire
- B. Switch
- C. Electric bulb
- D. Electric cell

8. The source of energy in a simple electric circuit is **(Easy)**

- A. Switch
- B. Bulb
- C. Dry cell
- D. Wire connecting the electrical circuit

9. The following is an example of a good conductor of electricity **(Average)**

- A. Rubber
- B. Copper
- C. Plastic
- D. Dry Wood

10. Materials that do not allow electric current to pass through them are called.

- A. Conductors **(Easy)**
- B. super conductors
- C. Weak conductors
- D. Semiconductors

11. A device that converts electrical energy into light energy in a simple electrical circuit

- A. Wire **(Average)**
- B. Battery
- C. Bulb
- D. Switch

12. If the electrical circuit is broken, then **(Difficult)**

Statement 1:Electricity flows in reverse

Statement 2:The current stops.

- A. Statement 1 is correct
- B. Statement 2 is correctS
- C. Both statements 1 and 2 are correct.

D. Both statements 1 and 2 are incorrect.

13. The function of a switch in an electrical circuit is **(Easy)**

- A. To increase the electric current
- B. To decrease the electric current
- C. To make and break the electrical circuit.
- D. To protect the electrical circuit.

14. In an experiment, a copper wire is wrapped around an iron nail to create an electromagnet. If in the first attempt one cell is connected to the circuit and in the second attempt two identical cells are connected to the circuit, then The strength of the magnetic field **(Average)**

- A. decreases in first attempt
- B. Increases in first attempt
- C. increases and then decreases in second attempt
- D. remains constant in both attempts

15 The principle of working of the electric room heater below is **(Easy)**



- A. Magnetic effect of electric current
- B. Heating effect of electric current
- C. Both Magnetic effect and Chemical effects of electric current
- D. Chemical effect of electric current.

16. The main reason for the heating effect in a conductor is **(Difficult)**

- A. Electric potential
- B. Electric current
- C. Electrical resistance
- D. Electric power

17. The property of the metal in the heating element of an heating electrical appliance is

- A. High resistance **(Average)**
- B. High conductivity
- C. Resistance and conductivity
- D. Low electric power

18. The material used in the heating element of the given appliance is (Average)



- A. Copper
- B. Tungsten
- C. Nichrome
- D. Aluminium

19) A group of devices based on the heating effect of electric current. (Average)

- A. Heater, crane, electric iron
- B. Hair dryer, electric kettle, electric bulb
- C. Fan, water heater, electric stove
- D. Mixer grinder, water Pump, Geyser

20. Compared to Nichrome, silver is a (Average)

- A. High resistivity metal
- B. Hard metal
- C. Low conductivity metal
- D. Metal with high conductivity

21. The following device is used in steel industries based on heating effect of electric current (Easy)

- A. Electric room heater
- B. Electric bulb
- C. High temperature furnace
- D. Electric stove

22. The following device ensures the flow of electricity in an electrical circuit (Easy)

- A. Electric wire
- B. Electric cell
- C. Switch
- D. Electric bulb.

23. An example of the oldest type of electric cell is **(Easy)**

- A. Lead acid battery
- B. Dry cell
- C. Solar cell
- D. Voltaic cell

24. Dry cell is a **(Easy)**

- A. Single use cell
- B. Dual use cell
- C. Cell in large size
- D. Rechargeable cell.

25. An electric current flows through a nichrome wire for some time. **(Average)**

- a. The wire gets hot
- b. A magnetic needle placed under the wire gets deflected.

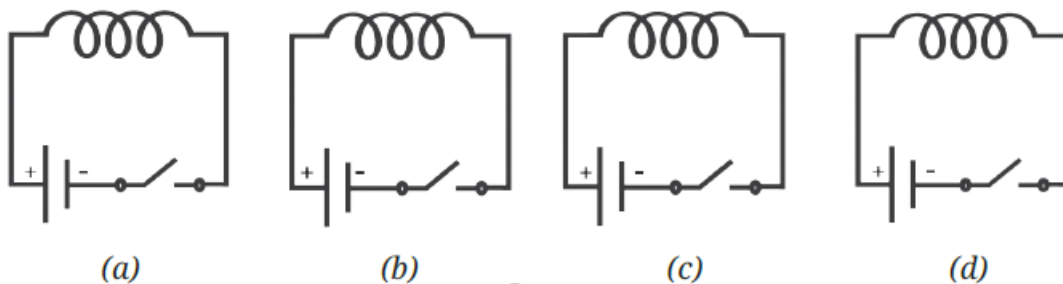
Choose the correct option

- A. Only a is correct
- B. Only b is correct
- C. Both a and b are correct
- D. Neither a nor b are correct.

26 Nichrome wire is commonly used in electrical heating devices because it **(Easy)**

- A. Has low resistance
- B. produces more heat for a given current
- C. is cheaper than copper
- D. is an electrical insulator

27. As shown in the figure, we have four coils a,b,c and d of the same shape and size made of iron, copper, aluminium and nichrome. When current flows through these coils, the needles of the compass placed near the coils show the deflection in this coil. **(Average)**



- A. Only in circuit (a)
- B. Only in circuits (A) and (B)
- C. Only in circuits (a), B) and (C)
- D. In all four electric circuits

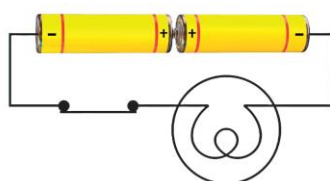
28. When the electric cells are named in order as shown in the figure, which is the correct option?  
(Average)



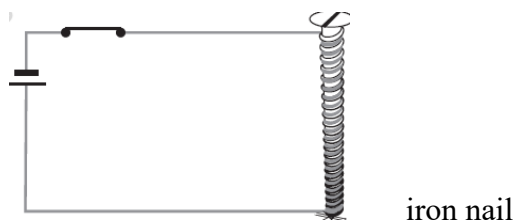
- A. Voltaic cell, Dry cell, Rechargeable
- B. Dry cell, Rechargeable cell, Voltaic cell
- C. Rechargeable cell Dry cell, voltaic cell
- D. Dry cell, Voltaic cell, Rechargeable cell

## II Answer the following questions : (1 mark)

- 29. What is a magnet? (Easy)
- 30. How is a magnet different from iron? (Average)
- 31. When does a compass needle deflect kept near an electric circuit? (Easy)
- 32. Identify the dry cell, switch, bulb, and conducting wires in the given circuit diagram. (Average)



- 33. On what principle does an electric bulb work? (Easy)
- 34. On what principle does an electric bell work? (Easy)
- 35. Name a lifting device that has electromagnets. (Average)
- 36. Name the effect that occurs around a wire when electricity flows through it? (Average)
- 37. In the diagram given below, what substance does the iron nail wrapped with the copper wire changing into? (Average)



38. Draw a simple electric circuit diagram.

**(Average)**

39 .

If a 1.5 V dry cell is used instead of a 9 V battery in the circuit diagram given below, what will be the deviation of the compass needle? Give a suitable reason.

**(Average)**



40. what is heating effect of electric current?

**(Easy)**

41 what is resistance?

**(Easy)**

42. Name the SI unit of resistance?

**(Easy)**

43. What is a heating element?

**(Average)**

44. Name the following device .

**(Average)**



45. What is the reason for installing a metal with high resistance in the heating element

46. Indicate which material in the table below is suitable for a room heater. **(Average)**

| Material | resistance |
|----------|------------|
| A        | 250 ohm    |
| B        | 500 ohm    |
| C        | 400 ohm    |

47. Name the device that converts chemical energy into electrical energy. **(Average)**

48. Name the liquid used in Voltaic cell?

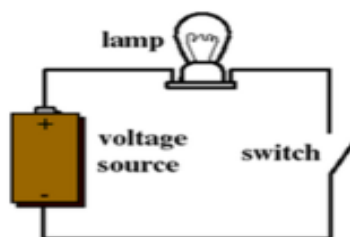
**(Easy)**

49. Why are electrodes made of metal plates?

**(Average)**

50. How do you conclude that whether current is flowing in the electrical circuit given below or not? Justify your answer.

**(Easy)**



51. Which component of the electrical circuit is shown in the figure below? What is its function?

**(Easy)**



### III. Answer the following questions.

**(2 mark)**

52. Sumana argues with Pradeep that there is an electromagnet in the mixer. But Veena does not agree with this. Whose argument is correct?

53. What are magnetic materials? Give an example

**(Easy)**

54. Mention the effects of electric current.

**(Average)**

55. What is the magnetic effect of electric current?

**(Easy)**

56. How do you determine that a magnetic field is produced around a wire when current flows through it?

**(Average)**

57. Define the magnetic field.

**(Easy)**

58. What is an electromagnet? Draw a diagram of an electromagnet.

**(Easy)**

59. Why is an electromagnet called a temporary magnet?

**(Average)**

60. How can the magnetic field generated in an electromagnet be increased?

**(Difficult)**

61. Give four examples of practical applications of the magnetic effect of electric current.

**(Difficult)**

62. How can the direction of the poles of an electromagnet be changed?

63. What is the heating effect of electric current?

**(Easy)**

64. Why does an electric bulb glow brightly?

**(Average)**

65. Give four examples of practical applications of the heating effect of electric current.

**(Difficult)**

66. What are the problems sometimes caused in household electrical circuits due to the heating effect of electric current? **(Difficult)**

67. State the functions of dry cells and batteries in an electrical circuit.

**(Average)**

68. How is a battery different from an electric cell?

**(Average)**

69. What is a dead cell? Give two examples.

**(Average)**

70. What is an electrolyte? What are the common solutions used for electrolytes? **(Difficult)**

71. Name some common metal pairs used in voltaic cells.

**(Average)**

72. What are dry cells? What are the elements used in the positive and negative electrodes?

**(Average)**

73. Dry cells are better than voltaic cells. How can this be justified?

74. What are rechargeable batteries? What are their uses?

**(Average)**

75. Name two devices that work with the help of rechargeable batteries.

**(Easy)**

76. Give an example of a rechargeable battery.

**(Easy)**

#### **IV Answer the following questions;**

**(3Marks).**

77. You are given a compass, a cell, a conducting wire and a switch as shown in the figure. Describe the experiment.



78. Describe the experiment you would carry out on electromagnetism with the help of the figure with due caution and answer the following questions. **(Difficult)**



A) Forgets to turn off the switch of the electromagnet that lifts the paper clips. After some time, the iron nail is not attracting the paper clips either. But the wire wrapped around the iron nail is still hot. Give possible reasons for this. **(Difficult)**

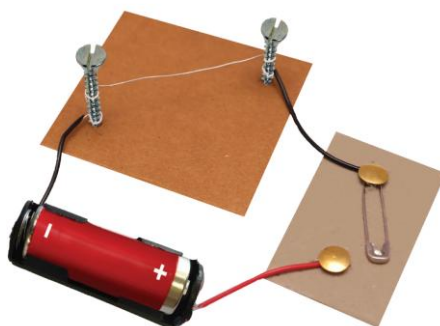
79. Electric heat generators (electric stoves) are considered more convenient than conventional heat generation methods (wood stove). Give reasons to support this statement keeping in mind the effects on society. **(Difficult)**

80. If the iron nail of the electromagnet is removed from the circuit and only the coil of wire is left, will the coil still deflect the compass? Will the deflection be greater or less than before? How can the direction of the deflection of the compass be reversed? **(Difficult)**



**V. Answer the following questions ( 4 marks)**

81. As shown in the figure, you are given a 10 cm long nichrome wire, a cardboard box and two nails, a battery, a switch and connecting wires . Using this, explain how to find out the resistance of the wire **(Difficult)**



82. Draw a simple model of a voltaic cell and identify its parts such as electrodes, glass beaker, connecting wire, electric lamp, and electrolyte. **(Average)**

83. Draw a circuit diagram of a lemon voltaic cell and identify the copper strip, iron nail, lemon and LED lamp in it. **(Average)**

**VI Answer the following questions. ( 5 mark)**

84. Geetha notices something while making coffee on an electric stove. Even though the heating element (coil) of the electric stove is red hot, the conductive wire connecting it to the plug is not hot at all. Answer Geetha's questions regarding this **(Average)**

a. What metals are the heating element and the connecting wires made of?

- b. Why does the connecting wire not get hot?
- c. What is the reason for the heating element to get hot quickly?
- d. Why is the heating element in the shape of a coil?
- e. Why is the connecting wire with an insulating coating used?

85. Fill the names of the electrical units given in the table.

**(Easy)**

|   |                                                                                   |  |
|---|-----------------------------------------------------------------------------------|--|
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

## CHAPTER 5.

### Exploring Forces.

| LO number | Learning outcome                                                                                                       | Question number |
|-----------|------------------------------------------------------------------------------------------------------------------------|-----------------|
| 6         | Explain the concept of force and its types, weight, mass and buoyant force with examples; differentiates between them. | 1 to 77         |

#### Distribution of questions based on difficulty

| Question type          | Easy | Average | Difficult | Total |
|------------------------|------|---------|-----------|-------|
| Multiple choice (1m)   | 06   | 05      | 10        | 21    |
| Very short answer (1m) | 09   | 12      | 06        | 27    |
| Short answer (2m)      | -    | 07      | 06        | 13    |
| Long answer (3m)       | -    | 01      | 04        | 05    |
| Long answer (4m)       | -    | -       | 07        | 07    |
| Long answer (5m)       | -    | -       | 04        | 04    |
| Total                  | 15   | 25      | 37        | 77    |

#### Distribution of questions based on objectives

| Question type          | Knowledge | Understanding | Application | Skill | Total |
|------------------------|-----------|---------------|-------------|-------|-------|
| Multiple choice (1m)   | 08        | 07            | 05          | 01    | 21    |
| Very short answer (1m) | 09        | 10            | 08          | -     | 27    |
| Short answer (2m)      | 06        | 04            | 03          | -     | 13    |
| Long answer (3m)       | 02        | 02            | 01          | -     | 05    |
| Long answer (4m)       | 02        | 03            | 02          | -     | 07    |
| Long answer (5m)       | 02        | 01            | 01          | -     | 04    |
| Total                  | 29        | 27            | 20          | 01    | 77    |

**1. Four alternative answers are given for the following questions. Choose the correct answer and write it with the appropriate letter (one mark)**

1. Pushing and pulling is called (easy)
  - A) Pressure
  - B) Force
  - C) Friction
  - D) Gravity
2. International unit of force (average)
  - A) Kilogram
  - B) Kelvin
  - C) Newton
  - D) Meter
3. The effect observed when a moving rubber ball is hit with a bat (difficult)
  - A) ball remains at rest.
  - B) ball changes its direction.
  - C) ball does not show any change .
  - D) shape of the ball changes.
4. Friction of moving objects (difficult)
  - A) Supports
  - B) Opposes
  - C) Increases
  - D) Does not affects
5. Friction on rough surfaces is (difficult)
  - A) will be high
  - B) will be less
  - C) Equal
  - D) flows
6. Like magnetic poles (easy)
  - A) attracts
  - B) Repels
  - C) in the same direction
  - D) centralizes
7. The charges that accumulate when two objects made of certain materials are rubbed are called (average)
  - A) Magnetic materials
  - B) Ions
  - C) Static charges
  - D) Atoms
8. Like charges always (easy)
  - A) attract
  - B) repels
  - C) moves away

- D) is stationary
9. Opposite charges always (easy)
- A) attracts
  - B) repel
  - C) moves away
  - D) is stationary
10. The force exerted by a charged body on another charged or uncharged body is called (difficult)
- A) Magnetic force
  - B) Static electric force
  - C) Muscular strength
  - D) Frictional force
11. If you throw anything around up, it will eventually fall to the ground. The reason is (difficult)
- A) the Earth has gravitational force
  - B) the earth has atmosphere
  - C) the Earth has frictional force
  - D) the Earth is a planet
12. The gravitational force is always (easy)
- A) Repulsive force
  - B) balanced
  - C) zero force
  - D) attractive force
13. The speed of an object thrown upwards as it falls down (difficult)
- A) Decreases
  - B) will be zero
  - C) Increases
  - D) No change
14. When an object is moving upwards, its speed until it stops, (difficult)
- A) Decreases
  - B) remains equal
  - C) increases
  - D) becomes zero
15. The capacity of the Earth to attract an object towards itself is called (average)
- A) force
  - B) Mass
  - C) charge.
  - D) Weight
16. Unit of weight is (easy)
- A) watt
  - B) Newton
  - C) Kilogram
  - D) meter.

17. String Scale – It ranges from (average)  
 A) 0 to 10 kilo gram  
 B) 0 to 20 kilo gram  
 C) 0 to 30 kilo gram  
 D) 0 to 50 kilo gram
18. Maximum weight that can be measured by a string scale (average)  
 A) 1 Newton  
 B) 3 Newton  
 C) 10 Newton  
 D) 20 Newton
19. A factor on which buoyancy depends on (difficult)  
 A) Concentration of the liquid  
 B) Temperature of the liquid  
 C) Nature of liquid  
 D) Density of liquid
20. Three objects 1, 2 and 3 of the same size and shape but made of different materials are placed in water and sink to different depths as shown in the figure. If the weights of  $W_1$ ,  $W_2$  and  $W_3$  relation are respectively, then (difficult)  
 i)  $W_1 = W_2 = W_3$   
 (ii)  $W_1 > W_2 > W_3$   
 (iii)  $W_2 > W_3 > W_1$   
 (iv)  $W_3 > W_1 > W_2$
21. If the gravitational force is greater than the buoyant force, then the object (difficult)  
 A) floats  
 B) sinks  
 C) flies  
 D) bounces

## II . Answer the following questions (one mark)

22. What is force? (easy)
23. Give some examples of situations where force is used in our daily life. (average)
24. If an object is at rest, it means that no force is being exerted on that object. substantiate. (average)
25. What are the types of force? (average)
26. What is the unit of force? (average)
27. What is contact force? (easy)
28. Give an example of contact forces? (average)
29. What is muscular strength? (average)
30. Give an example of pushing and pulling. (average)
31. What is the condition for a force to be effect? (difficult)
32. Give an example of the use of animal muscle power to assist human tasks. (difficult)
33. What is friction? (average)
34. How does friction work? (difficult)
35. How does friction occur? (difficult)

36. What happens to the friction force if the surface is rough? (difficult)
37. Write any one effect of force. (average)
38. What is non-contact force? (easy)
39. Give an example of non-contact forces. (easy)
40. What is magnetic force? (easy)
41. Give examples of magnetic materials. (easy)
42. What is electrostatic force? (easy)
43. Name the two poles of a magnet. (easy)
44. What are static charges? (average)
45. Name two types of static charges. (average)
46. What is the force of gravity or gravitational force? (average)
47. Why do all objects fall towards the Earth? (difficult)
48. What is weight? (easy)

### III . Answer the following questions (two mark)

49. State the effects of the force in the following situations. (difficult)
  - A) When a moving ball is hit with a bat
  - B) Pressing a balloon filled with air
50. Write the characteristics of friction force. (average)
51. How would you describe friction as a contact force? (difficult)
52. Take a notebook and place it on the table. Push it gently and observe. with the same book Perform the same activity in the sand. In these two activities (difficult)
  - 1) In which one did the notebook move faster?
  - 2) What could be the reason for this?
53. The shape of airplanes and ships is specific. Give a suitable reason for this. (average)
54. What are the differences between contact forces and non-contact forces? (average)
55. How would you demonstrate that magnetic force is a contactless force? (difficult)
56. Rekha says that walking on a tar road is easy but walking on sand is difficult. Can you support this statement with suitable reasons? (difficult)
57. Give your suggestions with reasons whether it is appropriate to use contact force or non-contact force to pull and push iron objects in an iron factory. (average)
58. Imagine what would happen if there was no gravitational force and explain it in your own sentences. (average)
59. What is the difference between weight and mass? (average)
60. We sometimes slip on smooth surfaces like ice or a shiny floor. Why? Explain. (average)
61. Is any force exerted on an object in non-uniform motion? (difficult)

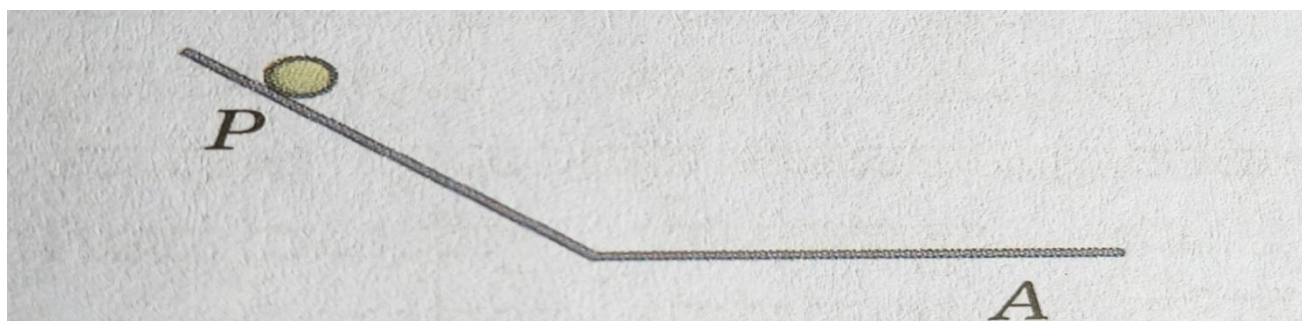
### IV. Answer the following questions (three marks)

62. Is muscular force is necessary to carry out some digestive processes in our body. Justify your answer with some examples. (difficult)
63. Muscle force and friction force are two contact forces, how are they different from each other? (difficult)
64. Using a plastic water bottle, demonstrate an experiment why an object floats and sinks. (average)
65. When you put a coin in a glass of water It sinks, but when you put a large wooden log in water, it floats. Give reason. (difficult)

66. The weight of an object on the moon becomes one-sixth of its weight on Earth. What is the reason for this change? Does the mass of the object also become one-sixth of its mass on Earth? (difficult)

**V Answer the following questions (four marks)**

67. Demonstrate through an activity that a magnet exerts a force at a distance without coming into contact. (difficult)
68. When a plastic scale is rubbed with polythene, the plastic scale attracts pieces of paper. How is this possible? (difficult)
69. What are the similarities and differences between magnetic force and electrostatic force? (difficult)
70. Friction is both a “need” and a “problem.” justify this statement. (difficult)
71. How to calculate the lines on a string scale? (difficult)
72. When a ball is thrown upwards, gradually its motion slows down, stops for a few moments and then returns to the ground. Name the forces acting on the ball and specify their directions. (difficult)
- A) During its upward movement  
B) During its downward movement  
C) at its highest point
73. A ball is released from point P and moves along an inclined plane and then along a horizontal surface as shown in the fig. It comes to stop at the point A on the horizontal surface. When the same ball is released from the point above P, where does it stop? Give reason if the ball stops (difficult)



- (i) Before the point A  
(ii) After the point A.

**VI . Answer the following questions (five marks)**

74. What are the effects of a force exerted on an object? (difficult)
75. Complete the following table. (Difficult)

| Serial No. | Action                                 | Push/pull | Effect |
|------------|----------------------------------------|-----------|--------|
| 1.         | When a moving ball is hit with a stick |           |        |
| 2.         | Pressing an inflated balloon           |           |        |
| 3.         | Stretching a rubber band               |           |        |

76. Explain through an experiment that the Earth attracts every object with equal force.

**(Difficult)**

77. As shown in the figure below, two balloons are filled with air and hang in such a way that they do not touch each other. When the two balloons are rubbed with a woolen cloth, do they repel or attract each other? Write your answers with appropriate reasons.

**(Difficult)**



## CHAPTER 6.

### Pressure, Winds, Storms and Cyclones

| LO number | Learning outcome                                                                                                                | Question number                                    |
|-----------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 4         | Understand and explain the relationship between pressure, atmospheric pressure and the movement of air.                         | 1,2,3,4,5,6,7,11,12,13,14,15,16,17,18, 22,26,28,36 |
| 5         | Explain the causes and effects of thunder, lightning and cyclones with the safety measures to be taken during their occurrence. | 8,9,10,19,20,21,23,24,25,27,29,30,31, 32,33,34,35  |

#### Distribution of questions based on difficulty

| Question type          | Easy | Average | Difficult | Total |
|------------------------|------|---------|-----------|-------|
| Multiple choice (1m)   | 04   | 04      | 02        | 10    |
| Very short answer (1m) | 03   | 04      | 03        | 10    |
| Short answer (2m)      | 05   | 03      | 02        | 10    |
| Long answer (3m)       | 02   | 02      | 02        | 06    |
| Total                  | 14   | 13      | 09        | 36    |

#### Distribution of questions based on objectives

| Question type          | Knowledge | Understanding | Application | Skill | Total |
|------------------------|-----------|---------------|-------------|-------|-------|
| Multiple choice (1m)   | 03        | 04            | 03          | -     | 10    |
| Very short answer (1m) | 03        | 05            | 02          | -     | 10    |
| Short answer (2m)      | 05        | 03            | 02          | -     | 10    |
| Long answer (3m)       | 02        | 02            | 02          | -     | 06    |
| Total                  | 13        | 14            | 09          | -     | 36    |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. The physical quantity that causes air pressure is ( EASY)  
A) Force B) Mass C) Velocity D) Mass
2. The force that causes us to feel weight when we carry a bag on our shoulders is:(AVERAGE)  
A) Magnetic force B) Electrostatic force C) Gravitational force D) Muscular force
3. The main purpose of to keep a round cloth bag people while carrying loads on their heads is (AVERAGE)  
a) Increase the force B) Increase the weight of the load  
C) Reduce the pressure D) Increase the pressure
4. The international unit of force is ( EASY)  
A) Pascal B) Meter C) Newton D) Second
5. The square meter is the international unit of ( EASY)  
A) Force B) Area C) Pressure D) Work
6. What is the pressure exerted by a force of 100 Newtons on a cardboard of area 4 square meters? (DIFFICULT)  
A) 25 N/m<sup>2</sup> B) 50 N/m<sup>2</sup> C) 10 N/m<sup>2</sup> D) 5 N/m<sup>2</sup>
7. The pressure exerted by a liquid in a container depends on which of its factors? (DIFFICULT)  
A) Volume B) Area C) Height of the column D) Mass
8. A large storm that forms over warm ocean waters is called (AVERAGE)  
A) Wind B) Cyclone C) Thunderstorm D) Lightning
9. Name of the cyclone that formed in India in 2020 is ( EASY)  
A) Amphan B) Nisarga C) Nivar D) Burevi
10. Dept. to create constant awareness about Cyclone (AVERAGE)  
A) Department of Indian News  
B) Indian Meteorological Department  
C) Indian Disaster Management Department  
D) Indian Department of Agriculture.

**II. Answer the following questions (One mark)**

11. What is pressure? ( EASY)
12. State the factors on which pressure depends. (DIFFICULT)

13. Write the formula for finding pressure. **(DIFFICULT)**
14. State the international unit of pressure. **(AVERAGE)**
15. What is atmosphere? **( EASY)**
16. State the components of atmospheric air. **(AVERAGE)**
17. What is atmospheric pressure? **(AVERAGE)**
18. How is wind formed at sea? **(DIFFICULT)**
19. What is a cyclone? **( EASY)**
20. What is the central area of low pressure in a cyclone called? **(AVERAGE)**

### **III. Answer the following questions (Two mark)**

21. State the different names given to cyclones in the following countries **(AVERAGE)**  
A) India B) Philippines C) Japan D) America
22. State the effects of force. **( EASY)**
23. Why are wide straps made while making handbags? **( EASY)**
24. Why do we not get crushed even if a column of atmospheric air exerts a force of 2250 Newtons on us? **(DIFFICULT)**
25. What is the reason for the occurrence of a land breeze? **( EASY)**
26. Explain an experiment that shows that air exerts pressure. **(AVERAGE)**
27. Why are holes made in hanging banners and billboards? **(DIFFICULT)**
28. State two safety precautions one should take during a thunderstorm. **( EASY)**
29. What are monsoon winds and why are they important to India? **(AVERAGE)**
30. . State three important factors that contribute to the development and destructive intensity of a cyclone. **( EASY)**

### **IV. Answer the following questions (Three mark)**

31. How does a thunder storm occur? **(AVERAGE)**
32. Explain the mechanism of lightning **( EASY)**
33. How do cyclones occur? **(AVERAGE)**
- 34 . Suggest three effective safety measures that people living in hurricane-prone coastal areas should take. **( EASY)**
- 35 . With the help of an example, explain how the unequal heating of land and water causes air currents during the winter and summer seasons. **(DIFFICULT)**
- 36 . Explain why hot air rises while cold air moves down. **(DIFFICULT)**

## CHAPTER- 7

### PARTICULATE NATURE OF MATTER.

| LO number | Learning outcome                                                                                                                                                    | Question number |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 2         | <i>Understand and explains the concepts of physical and chemical changes in matter, properties and its transformations; apply their uses in everyday situations</i> | 1 to 50         |

#### Distribution of questions based on difficulty

| Question type         | Easy | Average | Difficult | Total |
|-----------------------|------|---------|-----------|-------|
| Multiple choice (1m)  | 5    | 5       | 2         | 12    |
| Very short answer(1m) | 3    | 6       | 0         | 9     |
| short answer(2m)      | 1    | 4       | 6         | 11    |
| Long answer(3m)       | 0    | 9       | 2         | 11    |
| Long answer(4m)       | 0    | 3       | 0         | 3     |
| Long answer(5m)       | 0    | 3       | 1         | 4     |
| Total                 | 9    | 30      | 11        | 50    |

#### Distribution of question based on objectives

| Question              | Knowledge | Understanding | Application | Skill | Total |
|-----------------------|-----------|---------------|-------------|-------|-------|
| Multiple choice (1m)  | 2         | 6             | 4           | 0     | 12    |
| Very short answer(1m) | 4         | 3             | 2           | 0     | 9     |
| Short answer(2m)      | 2         | 5             | 4           | 0     | 11    |
| Long answer(3m)       | 2         | 1             | 4           | 4     | 11    |
| Long answer(4m)       | 0         | 3             | 0           | 0     | 3     |
| Long answer(5m)       | 0         | 2             | 2           | 0     | 4     |
| Total                 | 10        | 20            | 16          | 4     | 50    |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. Grinding chalk is a **(Easy)**
  - A. Physical change
  - B. Chemical change
  - C. Biological change
  - D. Periodic change
2. The primary difference between solids and liquids is that the constituent particles are **(Average)**
  - A. Closely packed in solids, while they are stationary in liquids.
  - B. Far apart in solids and have fixed position in liquids.
  - C. Always moving in solids and have fixed position in liquid.
  - D. closely packed in solids and more past each other in liquids.
3. If the distance between particles increases, the interparticle attraction **(Easy)**
  - A. Increases
  - B. Decreases
  - C. Does not change
  - D. Remains constant
4. Strength of interparticle forces ultimately decide **(Average)**
  - A. Color of the substances
  - B. Shape of the substances
  - C. Physical state of the substances
  - D. Appearance of the substances
5. A substance having a definite shape and volume **(Easy)**
  - A. Water
  - B. Air
  - C. Coconut oil
  - D. Iron piece
6. The state of matter having strong interparticle attraction, minimum interparticle space, and no free movement of particles **(Average)**
  - A. Solid
  - B. Liquid
  - C. Gas

D. Plasma

7. Identify the incorrect statement **(Difficult)**

A. Melting ice into water is an example of the transformation of a solid into a liquid.

B. Melting process involves a decrease in interparticle attractions during the transformation.

C. Solids have a fixed shape and a fixed volume.

D. The interparticle interactions in solids are very strong, and the interparticle spaces are very small.

8. In solids, inter-particle attraction force and melting point are **(Difficult)**

A. Directly proportional

B. Inversely proportional

C. No relation

D. Not dependent

9. The matter that has a definite volume but no definite shape and takes the shape of its container **(Easy)**

A. Brick

B. Water

C. Oxygen

D. Iron

10. The state of matter that has neither definite shape nor definite volume **(Easy)**

A. Solid

B. Liquid

C. Gas

D. Plasma

11. Choose the correct with proper justification if all the particles were removed from a chair. **(Average)**

A. No change in particles of chair

B. The chair will weigh less due to lost particles.

C. Nothing of the chair will remain

D. Something of the chair will remain

12. The state of matter in which there is lot of space between particles and this space can be reduced by applying external pressure **(Average)**

A. Solid

B. Liquid

C. Gas

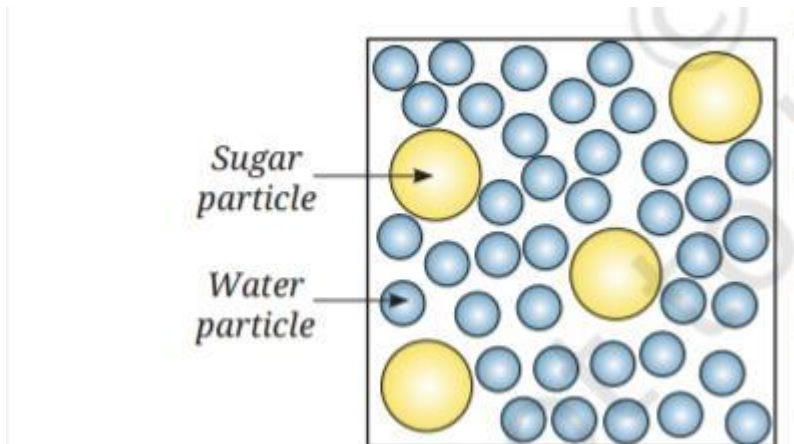
D. Suspension

## II. Answer the following questions (1 Mark)

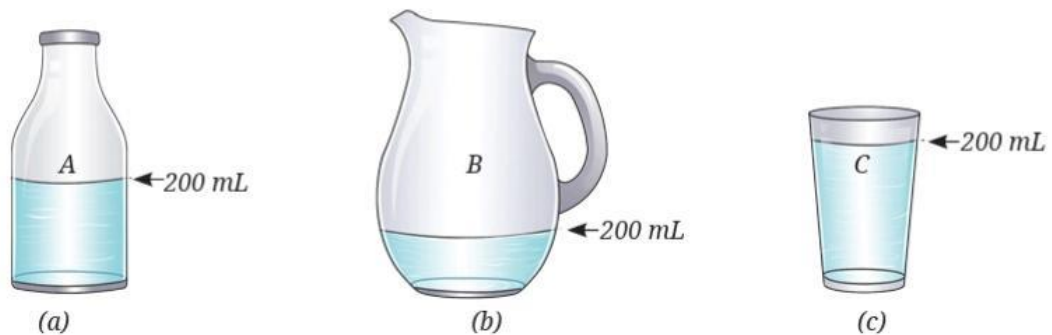
13. What is a constituent particle? (Easy)

14. What is meant by interparticle spaces? (Average)

15. Observe the given picture and state which property of particles of matter it indicates. (Average)



16. Observe, interpret, and apply the given figure to state a property of matter in the liquid state. (Average)



17. What force binds the constituent particles together in matter (Average)

18. What are the three states of matter? (Easy)

19. Give one example for each of the three states of matter. (Easy)

20. What is the melting point? (Average)

21. What is the boiling point? (Average)

## III. Answer the following questions (2 Marks)

22. What are the melting point and boiling point of pure water at sea level? **(Easy)**
23. Describe an experiment to show that water particles are in constant motion. **(Average)**
24. Explain how the fragrance of a perfume reaches us. **(Average)**
25. Explain the cleaning action of soap. **(Average)**
26. Three clean glass tumblers are taken. Hot water is poured into the first, water at room-temperature into the second, and ice-cold water into the third. A small grain of potassium permanganate is added to each tumbler. In which tumbler will potassium permanganate spread fastest and slowest? Give reasons. **(Difficult)**
27. State the changes that occur in particles when a solid changes into a liquid. **(Difficult)**
28. Why should we never eat or drink any substance found in a science laboratory? **(Average)**
29. Why do solids have a definite shape and volume? **(Difficult)**
30. Gases mix easily with one another. Why do solids not mix in the same way? **(Difficult)**
31. Even though salt is not visible, why does seawater taste salty? Explain. **(Difficult)**
32. Can air be compressed? Explain. **(Difficult)**

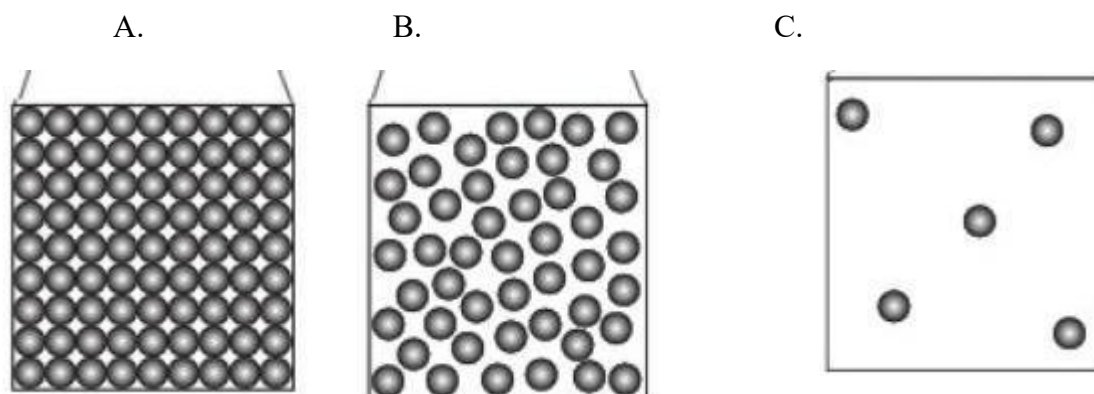
#### **IV. Answer the following questions (3 Marks)**

33. Classify the following situations as physical changes or chemical changes: **(Average)**
- Rusting of iron
  - Powdering a piece of chalk
  - Ice melting into water
  - Photosynthesis
  - Respiration
  - Digestion
34. What are interparticle attractions? On what factors strength of attractions depend? **(Average)**
35. State the melting points of the following solids: **(Average)**
- a. Ice
  - b. Urea
  - c. Iron
36. Describe an experiment to show that there is a lot of space between gas particles in their natural state. **(Average)**
37. Draw a diagram showing the increasing interparticle space in the three states of matter. **(Average)**
38. Represent with magnified schematic pictures of melting of a solid. **(Average)**
39. Draw a picture representing particles present in the following : **(Difficult)**
- (i) Aluminium foil

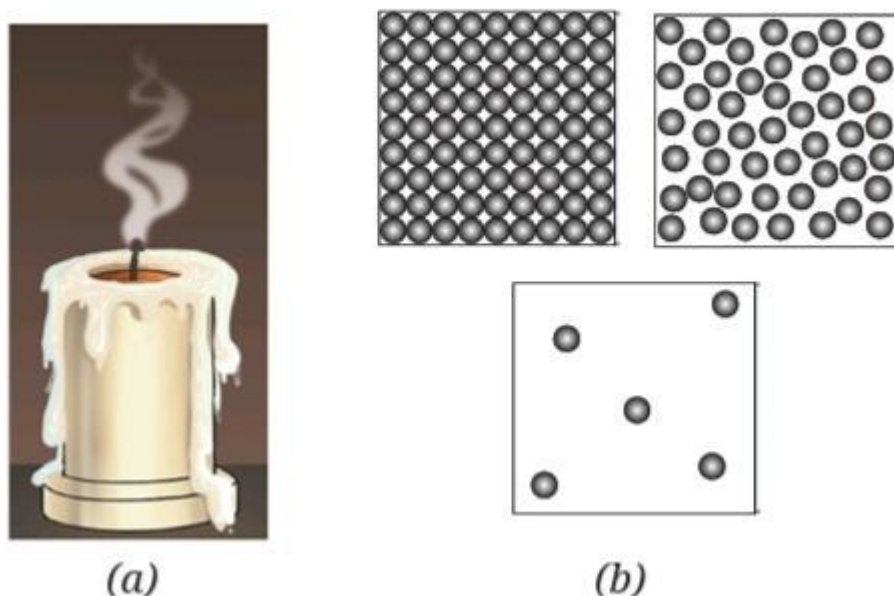
(ii) Glycerin

(iii) Methane gas

40. Observe the figure showing the interparticle spaces in the states of matter. Identify the states A, B, and C. **(Average)**



41. Observe the picture which shows the image of a candle that was just extinguished after burning for sometime. Identify the different states of wax in the figure and match with the pictures showing the arrangement of particles. **(Average)**



42. Explain what happens when sugar dissolves in water. **(Average)**

43. Explain the importance of change of state in the production, processing, and transportation of LPG. **(Difficult)**

#### V. Answer the following questions (4 Marks)

44. State the properties of matter in the solid state. **(Average)**

45. State the properties of matter in the liquid state. **(Average)**

46. State the properties of matter in the gaseous state. **(Average)**

#### VI. Answer the following questions (5 Mark)

47. Explain the differences in particle nature of the three states of matter. **(Average)**
48. Describe an experiment using a syringe to demonstrate the differences in spaces between particles in the three states of matter. **(Average)**
49. When spilled on the table, milk flows and spreads out, but the glass tumbler stays in the stem shape. justify the statement **(Difficult)**
50. Which substance is naturally available in all three states in nature? State the special characteristics of its three states. **(Average)**

## CHAPTER 8

### Nature of Matter: Elements, Compounds and Mixtures.

| LO number | Learning outcome                                                                                                            | Question number |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1         | Identify and classify the materials as elements, compounds and mixtures with reference to their properties and composition. | 1 to 86         |

#### Distribution of Questions Based on Difficulty

| Question Type          | Easy      | Average   | Difficult | Total     |
|------------------------|-----------|-----------|-----------|-----------|
| Multiple Choice (1m)   | 14        | 5         | 1         | 20        |
| Very Short Answer (1m) | 14        | 4         | 2         | 20        |
| Short Answer (2m)      | 3         | 11        | 4         | 18        |
| Long Answer (3m)       | -         | 3         | 4         | 07        |
| Long Answer (4m)       | 1         | 4         | 7         | 12        |
| Long Answer (5m)       | -         | 3         | 6         | 09        |
| <b>Total</b>           | <b>32</b> | <b>30</b> | <b>24</b> | <b>86</b> |

#### Distribution of Questions Based on Objectives

| Questions              | Knowledge | Understanding | Application | Skill    | Total     |
|------------------------|-----------|---------------|-------------|----------|-----------|
| Multiple Choice (1m)   | 12        | 5             | 3           | -        | 20        |
| Very Short Answer (1m) | 11        | 6             | 3           | -        | 20        |
| Short Answer (2m)      | 2         | 8             | 6           | 2        | 18        |
| Long Answer (3m)       | 1         | 4             | 1           | 1        | 07        |
| Long Answer (4m)       | 2         | 5             | 5           | -        | 12        |
| Long Answer (5m)       | -         | 3             | 4           | 2        | 09        |
| <b>Total</b>           | <b>28</b> | <b>31</b>     | <b>22</b>   | <b>5</b> | <b>86</b> |

**I. Four alternative choices are given for each of the following questions or incomplete statements. Write the correct answer along with its alphabet choice.**

- The air we breathe, water in a bottle, food in a lunch box, clothes, and footwear we wear are made up of (easy)  
 A) Matter  
 B) Object

C) Solution

D) Liquid

2. When two or more substances are mixed such that each substance retains its individual properties, it is called a (easy)
- A) Component
  - B) Matter
  - C) Mixture
  - D) Substance
3. Which of the following is an example of a homogeneous mixture (easy)
- A) Oggarane Avalakki (Seasoned beaten rice)
  - B) Mixture of sprouted grains
  - C) Lemonade
  - D) Mixture of iron and sulphur
4. Air is a (easy)
- A) Element
  - B) Compound
  - C) Mixture
  - D) Component
5. An alloy made of iron, nickel, chromium, and carbon is (easy)
- A) Bronze
  - B) Brass
  - C) Copper
  - D) Stainless steel
6. A mixture of sugar and water particles is called a (easy)
- A) Homogeneous mixture
  - B) Element
  - C) Heterogeneous mixture
  - D) Compound
7. The component of air necessary for living organisms to stay alive is (easy)
- A) Carbon dioxide
  - B) Nitrogen
  - C) Oxygen
  - D) Argon
8. The gas that supports combustion is (easy)
- A) Carbon dioxide
  - B) Nitrogen
  - C) Oxygen
  - D) Argon
9. The gas majorly present in the exhaled air we breathe out is (easy)
- A) Carbon dioxide
  - B) Nitrogen
  - C) Oxygen
  - D) Argon
10. Dust particles in the air are in a state of. (easy)
- A) Mixture
  - B) Solution

- C) Colloidal
- D) Suspended

11. When water is cooled, it changes into. (easy)
  - A) Water
  - B) Vapour
  - C) Mixture
  - D) Ice
12. When water is heated, it changes into (easy)
  - A) Water
  - B) Vapour
  - C) Mixture
  - D) Ice
13. It is an example of a metalloid (easy)
  - A) Silicon
  - B) Gold
  - C) Iron
  - D) Oxygen
14. Identify the metal among the following: (easy)
  - A) Gold
  - B) Hydrogen
  - C) Boron
  - D) Sulphur
15. The ratio of the number of hydrogen and oxygen atoms in water is: (easy)
  - A) 1:1
  - B) 2:1
  - C) 2:2
  - D) 2:3
16. A harmless substance essential for our life that enhances taste is (easy)
  - A) Salt
  - B) Sugar
  - C) Vinegar
  - D) Water
17. The chemical name of the harmless substance essential for our life that enhances taste is (easy)
  - A) Sodium chloride
  - B) Calcium oxide
  - C) Sodium hydroxide
  - D) Sugar
18. The ratio of atoms of sodium and chlorine in sodium chloride is: (easy)
  - A) 1:1
  - B) 2:1
  - C) 2:2
  - D) 2:3
19. The physical method used to separate salt from water is \_\_\_\_\_ (easy)
  - A) Condensation
  - B) Cooling
  - C) Evaporation

## D) Dissolution

20. Two substances A and B combine to form product C



Assume that A and B cannot be broken down into simpler substances. Based on this information, correct statement among the following is

- A) A, B, and C are all compounds and have a fixed composition.
- B) C is a compound, and A and B have a fixed composition.
- C) A and B are compounds, and C has a fixed composition.
- D) A and B are elements. C is a compound and has a fixed composition

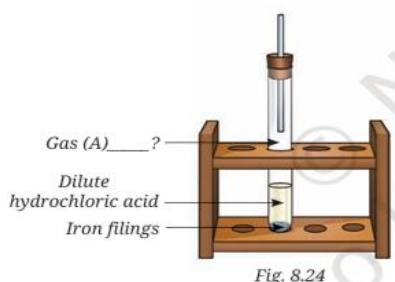
## II. Answer the following questions. (One-Mark)

- 21. What is matter made of? (easy)
- 22. What are the components of a mixture? (easy)
- 23. What is the proportion of nitrogen in the air? (easy)
- 24. Which gas turns lime water milky white? (easy)
- 25. Give an example of a pure substance. (easy)
- 26. What is food adulteration? (easy)
- 27. Why is adulteration done in food items? (easy)
- 28. What is a pure substance? (easy)
- 29. When electricity is passed through water, gases are released. Which gas burns with a "pop" sound when a burning candle is placed near the mouth of the test tube? (easy)
- 30. When electricity is passed through water, gases are released. Which gas makes the candle burn more brightly when placed near the mouth of the test tube? (easy)
- 31. Name the elements present in water? (easy)
- 32. How do you represent the reaction between hydrogen and oxygen to form water using a word equation. (easy)
- 33. What are elements? (easy)
- 34. What are elements made of? (easy)
- 35. A scientist wants to make a cooking utensil that does not rust easily and is very strong. Which material should they use? (easy)
- 36. Which two elements combine to form sodium chloride? (easy)
- 37. What is the advantage of alloying elements? (easy)
- 38. What are minerals? (easy)
- 39. Give examples of minerals. (easy)
- 40. List the properties of matter. (easy)

## III. Answer the following questions. (2-Mark)

- 41. List the characteristics of a mixture. (average)
- 42. Explain the types of mixtures with examples. (average)
- 43. What is an alloy? Give an example. (average)
- 44. List the components of air. (average)
- 45. Why is air considered a mixture? List the reasons. (average)
- 46. Write the word equation for the chemical reaction that occurs when quicklime is mixed with water. (average)
- 47. Classify the following into homogeneous and heterogeneous mixtures: (average)  
Vinegar, Soda water, Oil and water, Sea water, Alloy, Baking powder, Sand and water.
- 48. Food adulteration is an illegal process. Explain why. (average)

49. Draw a diagram of the experiment showing the chemical reaction when electricity is passed through water and label its parts. (average)
50. How will you test the nature of the gases released when electricity is passed through water? (average)
51. Name the types of elements. Give an example for each. (average)
52. What are metalloids? Give examples. (average)
53. What are compounds? Give examples. (average)
54. What do you observe when you heat a spoonful of sugar in a boiling tube? List your observations. (average)
55. You are given iron filings and sulphur powder. Explain how you will identify the type of mixture formed when they are mixed. (average)
56. Analyze Figure . Identify Gas A and write the word equation for this chemical reaction. (Context: Dilute Hydrochloric acid reacting with Iron filings) (average)



57. Water, a compound formed by the combination of oxygen and hydrogen elements, has properties entirely different from its constituent elements. Justify this statement. (average)
58. Write the names of any two compounds formed only by non-metals and state two uses of each.
59. Can gold be classified as both a mineral and a metal? How? (average)

#### IV. Answer the following questions. (3-Mark )

60. Describe an experiment to detect the presence of carbon dioxide in the air.(difficult)
61. Complete the following table .(difficult)

| Sl.No. | Mixture-type      | Examples                                                | Uniform or non-uniform |
|--------|-------------------|---------------------------------------------------------|------------------------|
| 1.     | Gas and gas       | Air                                                     |                        |
| 2.     | Gas and liquid    | Aerated water (soda water)<br>Oxygen dissolved in water |                        |
| 3.     | Solid and gas     | Carbon particles in air                                 |                        |
| 4.     | Liquid and liquid | Acetic acid in water (vinegar)<br>Oil and water         |                        |
| 5.     | Solid and liquid  | Sand and water<br>Seawater                              |                        |

|    |                 |                                                         |  |
|----|-----------------|---------------------------------------------------------|--|
| 6. | Solid and solid | Baking powder (baking soda and tartaric aciD)<br>Alloys |  |
|----|-----------------|---------------------------------------------------------|--|

62. According to science, how would you classify milk, packaged fruit juice, baking soda, sugar, and soil into mixtures or pure substances? .(difficult)
63. Classify the following into metals, non-metals, and metalloids: .(difficult)  
Gold, Silver, Magnesium, Iron, Carbon, Sulphur, Hydrogen, Silicon, Boron, Oxygen.
64. You are given sugar, iron, and milk. Which of these is a chemical compound? How will you detect it? ( average)
65. In which of the following cases are the examples correctly matched? Give reasons to support your answer. ( average)
- 1.Elements - Water, Nitrogen, Iron, Air
  - 2.Homogeneous mixtures - Minerals, Sea water, Bronze, Air
  - 3.Pure substances - Carbon dioxide, Iron, Oxygen, Sugar
  - 4.Heterogeneous mixtures - Air, Sand, Brass, Muddy water
66. Iron reacts with moist air to form iron oxide, and magnesium burns with oxygen to form magnesium oxide. Classify all the substances involved in the above reactions into elements, ompounds, and mixtures.(difficult)
67. In the textbook diagram, "Pure" is written on a milk packet. From a scientific perspective, can milk be called a pure substance? Give a suitable reason for your answer. (difficult)



68. Would You decide to buy food products by looking at the "Pure" label on food pocket or not ? Mention two factors you should check to ensure the quality. (difficult)
69. Observe the examples given below. Predict and write any two adverse effects of food adulteration on health. (difficult)



70. The composition of air may vary slightly in different places." Explain this statement with an example (the difference between an industrial area and a forest area). (difficult)
71. A scientist subjects a specific substance to various chemical reactions but is still unable to break it down into simpler substances. Is that substance an element or a compound? Give reasons for your answer. (difficult)

72. Even when a pure gold biscuit is crushed into very tiny particles, its color and luster do not change. How will you explain this based on the definition of elements? (difficult)
73. water is formed by combining of hydrogen and oxygen. Hydrogen and oxygen are element, but why can't we call water is an element? (difficult)
74. "In a sample of pure water obtained from any source, the ratio of the mass of hydrogen to oxygen is always 1:8." Which law of chemical combination does this statement support? Explain. (difficult)
75. Why are minerals like magnetite and hematite highly important in the industrial field? Is it possible to construct massive buildings without using them? (difficult)
76. Minerals are naturally occurring substances. In that case, can a diamond artificially prepared in a laboratory be called a 'mineral'? Give reasons. (difficult)
77. What is the role of minerals in the manufacturing of electronic equipment such as mobile phones and laptops? Predict the consequences on human life if the Earth's mineral reserves are completely exhausted. (difficult)

**V. Answer the following questions. (4-Mark )**

78. Classify the following into elements, compounds, or mixtures in the given table:  
Carbon dioxide, Sand, Sea water, Magnesium oxide, Muddy water, Aluminium, Gold, Oxygen, Rust, Iron sulphide, Glucose, Soda water, Fruit juice, Nitrogen, Sodium chloride, Sulphur, Hydrogen, Baking soda. (difficult)
79. Is it possible to classify a substance as both an element and a compound? Explain how it is possible or why it is not possible? (difficult)
80. How would our daily lives change if water were a mixture of hydrogen and oxygen instead of being a compound? Think and write. (difficult)
81. Explain the experiment of the chemical reaction that occurs when quicklime is mixed with water, along with the chemical equation. (difficult)
82. Explain the experiment of the chemical reaction that causes limewater to turn milky white, along with the word equation. (difficult)
83. Explain with a diagram the experiment showing the effect when electricity is passed through water. (difficult)
84. List the benefits of chemists studying the combination of elements. (average)

**VI. Answer the following questions. (5-Mark)**

85. Rahul prepares sample 'A' by thoroughly mixing 5.6g of iron filings and 3.2g of sulphur powder. He then heats half of this mixture strongly to obtain a black substance, sample 'B'. Now, scientifically analyze the following situations and give reasons:
  1. What happens when a magnet is brought near sample 'A' and sample 'B'? Explain why.
  2. What are the gases released when dilute hydrochloric acid is added to sample 'A' and sample 'B'? How will you identify those gases?
  3. What conclusion do you draw from the above experiment?
86. Malini heats a spoonful of sugar in a boiling tube and notices that the color of the sugar changes and turns black. Based on these facts, answer the following questions:
  1. When sugar is heated, water droplets appear on the inner sides of the test tube. Can you tell where these water droplets came from?
  2. What is the black chemical substance collected on the watch glass at the end of the experiment? Write its properties.
  3. Write two precautionary measures you must take while performing this experiment.

**Chapter -9**  
**The Amazing world of solutes, solvents and solutions.**

| LO number | Learning outcome                                                                                                         | Question number |
|-----------|--------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>3</b>  | Understand and define the concepts of solubility, purity, concentration and determine the effects of temperature on them | 1 to 62         |

**Weightage to difficult level**

| Questions        | Easy | Average | Difficult | Total |
|------------------|------|---------|-----------|-------|
| MCQ              | 8    | 9       | 6         | 23    |
| 1 Mark questions | 9    | 6       | 2         | 17    |
| 2 Mark questions | 3    | 3       | 4         | 10    |
| 3 Mark questions | 1    | 3       | 3         | 7     |
| 4 Mark questions |      | 1       | 2         | 3     |
| 5 Mark questions | 1    |         | 1         | 2     |
| Total            | 22   | 22      | 18        | 62    |

**Weightage to objectives and different types of the questions**

| Questions        | Remembering | Understanding | Applying | Skill/HOTS | Total |
|------------------|-------------|---------------|----------|------------|-------|
| MCQ              | 9           | 8             | 4        | 2          | 23    |
| 1 Mark questions | 4           | 6             | 5        | 2          | 17    |
| 2 Mark questions | 3           | 2             | 2        | 3          | 10    |
| 3 Mark questions | 2           | 2             | 2        | 1          | 7     |
| 4 Mark questions | 1           | 1             | 1        | –          | 3     |
| 5 Mark questions | –           | 1             | –        | 1          | 2     |
| Total            | 19          | 20            | 14       | 9          | 62    |

**I. Choose the correct answer to the following incomplete statements/questions , write the answers in alphabetical order (1 mark )**

- 1) The solid component in a solution is generally called , (Easy)
- A) solute
  - B) Solvent
  - C) Colloids
  - D) Suspension

2) The most abundant solute in air solution is , (Average)  
A) Oxygen  
B) Carbon di oxide  
C) Organ  
D) Nitrogen

3) A dilute solution among the following is (Average)  
A) Coffee  
B) Sugarless tea  
c ) kheer  
D) Sea water

4) The increase in solubility of a solution depends on , (Average)  
A) the temperature is reduced  
B) the temperature is increased  
C) the pressure is reduced  
D) the pressure is increased

5) Baking soda is dissolved in water at temperatures of 20° C, 50°C, 70 ° C and 30°C, in this temperature of water, it will dissolve the least amount of baking soda (Average)

- A) 20° C
- B) 50°C
- C) 70° C
- D) 30°C

6) A saturated solution behaves as an unsaturated solution , when (Easy)  
A) the temperature is low  
B) the temperature increases  
C) the temperature is at 0°C,  
D) the pressure is low

7) To ensure that oxygen is dissolved in water , (Easy)  
A) Since water is in liquid form  
B) Because water has no shape  
C) By the growth of aquatic plants and fish  
D) Water flowing

8) As temperature increases, the solubility of gases generally , (Easy)  
A) decreases  
B) increases  
C) no change.  
D) equal

9) A solution is the best example for mixtures among the following is, (Easy)  
A) heterogeneous mixture  
B) chemical compound  
C) mass of particles  
D) homogeneous mixture

- 10) A universal solvent among the following is, (Easy)
- A) kerosene
  - B) alcohol
  - C) oxygen
  - D) water
- 11) A solution that cannot dissolve more solute at a particular temperature is called (Average)
- A) Concentrated solution
  - B) Saturated solution
  - C) Unsaturated solution
  - D) Aqueous solution
- 12) This type of change occurs when salt is dissolved in water (Difficult)
- A) Biological change
  - B) Chemical change
  - C) Permanent change
  - D) Physical change
- 13) Soluble solute in soda drinks is (Difficult)
- A) Nitrogen
  - B) Oxygen
  - C) Carbon dioxide
  - D) Hydrogen
- 14) The special property that explains the weight of an object is called , (Difficult)
- A) Pressure
  - B) Force
  - C) Mass
  - D) Density
- 15) The formula for calculating the density of a substance is , (Difficult)
- A) Density = mass / volume
  - B) Density = size / mass
  - C) Density = Pressure / Volume
  - D) Density = Volume / Pressure
- 16) The density of a substance does not depend on (Difficult)
- A) Shape
  - B) Temperature
  - C) Pressure
  - D) Mass
- 17)  $1 \text{ kg/m}^3$  can be written as , (Average)
- A)  $100 \text{ g/m}^3$
  - B)  $1000 \text{ g/m}^3$
  - C)  $10 \text{ g/m}^3$
  - D)  $1000 \text{ L/g}^2$
- 18) The amount of matter in any object is called , (Average)
- A) weight
  - B) Density
  - C) Mass
  - D) pressure

- 19) SI unit of size , (Easy)  
 A) cubic meter  
 B) millimeter  
 C)  $\text{kg/m}^3$   
 D) Meter
- 20) As one goes deeper into the earth's crust , (Difficult)  
 A) Density decreases  
 B) Density increases  
 C) Pressure decreases  
 D ) Temperature decreases
- 21) substance is heated, then its density (Average)  
 A) decreases  
 B) Increases  
 C) No change.  
 D) becomes zero
- 22) On this physical state of matter the effect of pressure greater (Average)  
 A) Solid  
 B) liquid  
 C) Gas  
 D ) Plasma
- 23) This property of water causes water pipes to break in winter , (Easy)  
 A) Compression  
 B) Condensation  
 C) Expansion.  
 D) Evaporation

## II. Answer the following questions.

( One mark )

- 24) What is a solution ? (Easy)
- 25) What is a solute and solvent ? Give an example , (Easy)
- 26) Name the solute and solvents present in tea. (Easy)
- 27) Name the solute and solvents present in air , (Easy)
- 28) What is an concentration ? (Average)
- 29) You have a bottle of size 2 liters. you pour 500 ml of water into it, how much more water can that bottle hold ? (Average)
- 30) What type of solution is sugar syrup an example of , (Easy)
- 31) What is the change in the physical state of a gas as pressure increases ? (Easy)
- 32) Give an example of a homogeneous mixture , (Easy)
- 33) Which mixture in which the components can be seen with the naked eye or with a magnifying lens? (Average)
- 34) Write the increasing order of their densities. Of the following. (Easy)  
 piece of iron, a piece of cotton, wood and castor oil.
- 35) What is the submultiple unit commonly used to measure a liter ? (Average)
- 36) What is the instrument commonly used to measure the volume of liquids ? (Average)
- 37) What is the formula used to find the volume of an object ? (Difficult)
- 38) Write the formula used to find the density of a substance . (Difficult)

- 39) At what temperature is the density of water maximum ? (Easy)
- 40) What is the unit of measurement for weight ? (Average)

**III. Answer the following questions. ( 2 Mark )**

- 41) What are saturated and unsaturated solutions? (Average)
- 42) Classify the components we use while making tea as solute , solvent and solution. (Easy)
- 43) What is solubility of a solute?
- Give an example of how temperature affects solubility of a solute ? (Average)
- 44) Which of the solutions prepared by dissolving two teaspoons of salt in 100 ml of water or four teaspoons of salt in 50 ml of water is more concentrated ? (Difficult)
- 45) What is the reason for ice floats on water ? (Average)
- 46) Which of the following, A wooden stick and an iron rod of the same size, will sink ? and floats ? Give a suitable reason . (Difficult)
- 47) A note book has a length of 25 cm, a width of 18 cm and a height of 2 cm. Find its volume . (Difficult)
- 48) A transparent stone mass is 16.400 g and its volume is 5 cm<sup>3</sup> Find its density . (Difficult)
- 49) How is the nature of the particles of matter is related to heat ? (Difficult)
- 50) On what principle does a hot air balloon work ? (Difficult)

**IV. Answer the following questions. ( 3 Mark )**

- 51) How do aquatic organisms survive in water , even in extreme cold ? (Average)
- 52) What is the solubility of a solute? (Easy)
- 53 ) A piece of iron has a mass of 600 gm and a density of 7.9 g/cm<sup>3</sup> then what is its volume ? (Difficult)
- 54) What are dilute solutions and concentrated solutions ? Give an example . (Difficult)
- 55) Explain with an experiment how temperature affects the solubility of a solution . (Difficult)
- 56) A stone sculpture weighs 25 g and has a volume of 90 cm<sup>3</sup>. Calculate its density and predict whether it will float or sink in water . (Difficult)
- 57) Why does the oil float on top of the water ? (Difficult)

**V. Answer the following questions . ( 4 mark )**

- 58) Why do unpeeled oranges float ? But why do peeled fruits sink ? Explain . (Difficult)
- 59) Object A has a mass of 200 g and a volume of 40 cm<sup>3</sup> , object B has a mass of 240 g and volume of 60 cm<sup>3</sup> Explain which material is dense . (Difficult)
- 60) Reema has a piece of modelling clay weighing 120 grams . She first shapes it into a small cube of size 60 cm<sup>3</sup>. Later she flattens it into a thin sheet, predict what happens to its density. (Difficult)

**VI. Answer the following questions. ( 5 mark )**

- 61) Explain with an experiment how the density of a solid object having an irregular shape can be determined . (Difficult)
- 62) Draw a diagram showing the different layers of the Earth, identify the different layers , and write them in the order of increasing density . (Easy)

## Chapter : 10

### Light, mirrors and lenses .

| LO number | Learning outcome                                                                                                                                                                                                                                                                                       | Question number |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 8         | State the laws of reflection;<br>Identify angle of incidence and angle of reflection;<br>differentiate between converging and diverging mirrors; recall the uses of mirrors to day to day life;<br>Define mirrors and lenses;<br>differentiate between types of lenses and mention the uses of lenses. | 1 to 62         |

#### Weightage to difficult level

| Questions        | Easy | Average | Difficult | Total |
|------------------|------|---------|-----------|-------|
| MCQ              | 11   | 12      | 6         | 29    |
| 1 Mark questions | 8    | 6       | 1         | 15    |
| 2 Mark questions | 2    | 7       | 4         | 13    |
| 3 Mark questions | 1    | -       | 2         | 3     |
| 4 Mark questions | -    | 1       | 1         | 2     |
| 5 Mark questions | -    | -       | -         | -     |
| Total            | 22   | 26      | 14        | 62    |

#### Weightage to objectives and different types of the questions

| Questions        | Remembering | Understanding | Applying | Skill | Total |
|------------------|-------------|---------------|----------|-------|-------|
| MCQ              | 10          | 9             | 6        | 4     | 29    |
| 1 Mark questions | 4           | 5             | 4        | 2     | 15    |
| 2 Mark questions | 3           | 4             | 3        | 3     | 13    |
| 3 Mark questions | 1           | 1             | -        | 1     | 3     |
| 4 Mark questions | 1           | -             | -        | 1     | 2     |
| 5 Mark questions | -           | -             | -        | -     | -     |
| Total            | 19          | 19            | 13       | 11    | 62    |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. Light Reflective The object is . ( Easy )
- A. Glass panel
  - B. Mirror
  - C. Lens
  - D. Plastic panel
2. The light in the mirror ( Easy )
- A. Refracts
  - B. Divides
  - C. Reflects
  - D. Absorbs
3. An example of a spherical mirror that we can see in everyday life (Average )
- A. A new steel spoon
  - B. Water surface
  - C. Smooth floor
  - D. Glass cup
4. These are the two types of spherical mirrors ( Easy )
- A. Plane mirror and convex mirror
  - B. Plane mirror and concave mirror
  - C. Convex mirror and concave mirror
  - D. A semi-transparent mirror and your mirror
5. This is how an object looks in a concave mirror. (Average)
- A. Large in size and erect
  - B. Small in size and erect
  - C. Large in size and inverted
  - D. Small in size and inverted

6. The part reflected in a convex mirror is **(Easy)**

- A. Flat
- B. is curved
- C. Has an inwardly curved surface
- D. Has an outwardly curved surface

7. Mirrors are metal coated to reflect light is **(Easy)**

- A. Aluminum
- B. Sodium
- C. Potassium
- D. Magnesium

8. The following statements are given regarding the manufacture of spherical mirrors.

Statement 1 Spherical mirrors are not made by cutting a hollow glass sphere.

Statement 2. A flat piece of glass is polished and polished to a curved surface and then coated with a thin layer of aluminum.

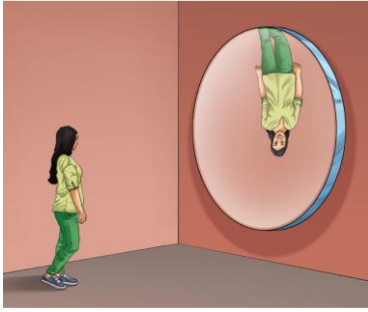
(Difficult)

- A. Statement 1 is correct.
- B. Statement 2 is correct.
- C. Statements 1 and 2 are correct.
- D. Statements 1 and 2 are incorrect.

9. A mirror used by dentists to detect cavities , **(Easy)**

- A. Convex mirror
- B. Concave mirror
- C. Convex and concave mirror
- D. Plane mirror.

10. A woman walks towards a large concave mirror in a museum. she notices **(Easy)**



- A. The size of their direct image shrinks .
- B. The size of their inverted image gets smaller .
- C. The size of their inverted image increases and Ultimately it becomes a direct and large reflection .
- D. Their direct image size becomes larger.

11. A mirror that makes the image of an object appear smaller in size than the object itself.  
**(Average)**

- A. Convex mirror
- B. Concave mirror
- C. Plane mirror
- D. Both convex and concave mirrors

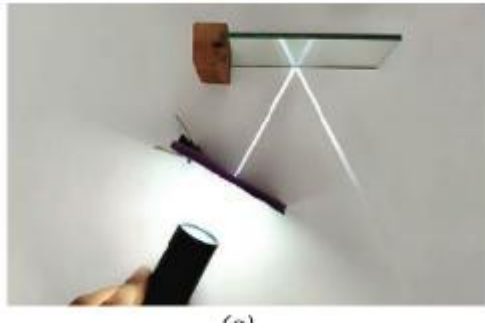
12. Reason for using convex mirrors as rearview mirrors in vehicles **(Average)**

- A. Provides a reduced field of vision.
- B. Better than a concave mirror.
- C. Easy to install in vehicles.
- D. Provides a wide field of vision.

13. When these light devices are held facing the sun and focused on a piece of paper, the paper burns. These light devices Which is **(Average)**

- A. Concave mirror and convex lens
- B. Convex mirror and convex lens
- C. Concave mirror and concave lens
- D. Convex mirror and concave lens.

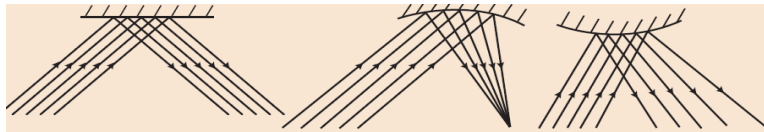
14. The given diagram is related to the reflection of light.



In this, the relationship between the angle of incidence and the angle of reflection is  
**(Difficult)**

- A. The angle of incidence is greater than the angle of reflection.
- B. The angle of incidence is smaller than the angle of reflection.
- C. Both the angle of incidence and the angle of reflection are equal.
- D. The angle of incidence and the angle of reflection are not equal.

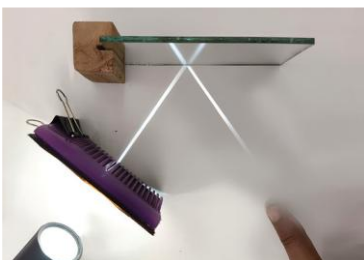
15. The mirrors shown in the diagram below are respectively , **(Average)**



- A. Concave mirror , concave mirror , plane mirror
- B. Convex mirror , plane mirror , concave mirror
- C. Convex mirror , concave mirror , plane mirror
- D. Plane mirror , concave mirror , convex mirror.

16) In the following diagram this law of light is referred

**(Average)**



- A. Law of reflection
- B. Law of refraction
- C. Two laws of reflection and refraction
- D. Law of Distraction

17. The following statement is correct for a ray of light falls on the perpendicular to a mirror  
(Difficult)

- A. The angle of incidence is  $90^{\circ}$
- B. The angle of incidence is  $0^{\circ}$
- C. The angle of reflection is  $90^{\circ}$
- D. In this case, no reflection of light takes place.

18) Reflected rays in a concave mirror , (Easy)

- A. Converges
- B. Condensation
- C. Diverges
- D. Scattering

19) This mirror produces diverging reflection of light ( Easy)

- A. Concave mirror
- B. Concave lens
- C. Convex mirror
- D. Plane mirror

20) An important characteristic of a concave mirror is that ,  
(Average)

- A. It is flat at the edge.
- B. Bulging in the middle
- C. Completely flat
- D. inward curve in the middle and bulging at the edges

21) Without using a match box, the following can be used to ignite a piece of paper with the help of sunlight (Easy)

- A. Plane mirror
- B. Concave mirror
- C. Convex mirror
- D. Pebble.

22) This property of a water drop makes the letters below the water drop look different?

- A. Transparency (Average)
- B. Density
- C. Compound form
- D. Curved surface of a water drop

23) Identify the object seen in this diagram

(Easy)



- A. Concave lens
- B. Concave mirror
- C. Convex lens
- D. Convex mirror

24) Identify the object is seen in this diagram

(Easy)



- A. Convex mirror
- B. Convex lens
- C. Concave lens
- D. Concave mirror

25) If an object is placed close to beyond the convex lens the viewed image of the object in the lens, will ,

(Difficult)

- A. appear smaller
- B. upside down.
- C. looks point size
- D. appear erect and large in size.

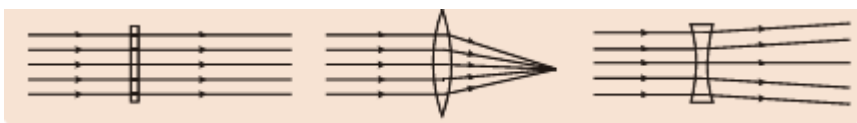
26) If an object is placed behind a convex lens, as the distance between the object and the convex lens increases the object appear as

(Difficult)

- A. Inverted
- B. Erect
- C. Big
- D. Point size

27) The following diagrams indicate

(Average)



X

Y

Z

- A. X Divergent Y Parallel Z Convergent
- B. X Convergent Y Divergent Z parallel

C. X Parallel Y Convergent Z Divergent

D. X Curved Y Parallel Z Scattered

28) This object can be placed in place of a concave mirror in the path of the sun's rays to burn a piece of paper **(Average)**

A. Concave lens

B. Plane mirror

C. Biconvex lens

D. Convex lens

29) The following question is based on proposition and reason. **(Difficult)**

Assertion : It is preferable to use a convex mirror to observe the traffic behind us.

Reason : Convex mirrors provide a significantly wider field of view than plane mirrors.

Choose the correct option.

A. Both proposition and reason Correct and the reason is the correct explanation for the proposition.

B. Both the proposition and the reason are correct . But the reason is not a correct explanation for the proposition.

C. The proposition is correct but the reason is incorrect.

D. Both the statement and the reason are false.

## II. Answer the following questions

**( One mark Questions )**

30). What is a mirror ?

**(Easy)**

31). What are the two types of mirrors ?

**(Easy)**

32). What is a spherical mirror ?

**(Easy)**

33). Give two examples of spherical mirror.

**(Easy)**

34). Draw a diagram of a convex mirror.

**(Average)**

35). Draw a diagram of a concave mirror .

**(Average)**

36). A convex mirror is given to the Rekha. How does she detect it based on the reflection in it ?

**(Average)**

37) Which mirror used in vehicle headlights ?

**(Easy)**

38). List two characteristics of reflection in plane mirrors.

**(Average)**

39 ). Which mirror get converged the light rays ?

**(Easy)**

40) Name the mirror is used as a surveillance mirror in shops.

**(Easy)**

41) What is a transparent material used in a magnifying glass ? (Easy)

42) What is the lens in our eye ? (Easy)

### III. Answer the following questions

(2 Mark)

43) State the difference between incident ray and reflected ray. (Average)

44). Why is a concave mirror is called converging mirror ? (Average)

45) What are solar concentrators ? (Easy)

46) What is a concave lens ? (Easy)

47) How do objects placed behind a concave lens and viewed through the lens appear ? (Average)

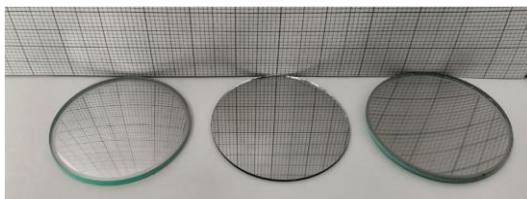
48) Write the two laws of reflection of light , (Easy)

49) Why is a concave lens called diverging lens and a convex lens is called converging lens ? (Difficult)

50) State the important uses of lenses. (Average)

51) What is the property of the eye that Helps to see near and far objects ? (Average)

52) Three mirrors — plane, concave and convex are placed in below figure. On the basis of the images of the graph sheet formed in the mirrors, identify the mirrors and write their names (Simple)



1

2

3

53 ) State any two differences between a convex mirror and a concave mirror. (Difficult)

54) How do you make a convex mirror and a concave mirror using a flat piece of glass ? (Difficult)

55) List any four uses of a concave mirror. (Average)

56) In the pictures given below, a toy is placed respectively in front of a concave mirror and a convex mirror. In the 1st picture, the toy is placed close to the mirrors, and in the 2nd picture, the toy is placed far away from the mirrors. Differentiate the changes in the images formed in both these mirrors.

(Difficult)



57) The atmosphere is filled with bright sunlight . You are given a handful of dry grass and a lens..Which type lens you use to ignite the grass without the help of a matchbox ?  
(Simple)

### III. Answer the following questions

(3 Mark )

58). Illustrate the law of reflection of light with the help of a picture . (Easy)

59) The figure below shows a concave mirror and a sheet of paper. Explain the experiment and state your conclusion. (Difficult)



60) Just like a plane mirror, do concave and convex mirrors also obey the laws of reflection? By applying this law, draw ray diagrams to show the convergence and divergence of incident rays in plane, convex, and concave mirrors. (Difficult)

### IV. Answer the following questions

( 4 Mark )

61) Briefly explain the models of units that produce heat with the help of a mirror, utilizing solar energy to solve future fuel challenges.  
(Average)

62) You are provided with a plane mirror, a torch, a comb, and stands to hold the comb, as shown in the figure below. Explain the experiment related to this along with the conclusion.  
(Difficult)

## CHAPTER.11

### Keeping time with the skies.

| LO number | Learning outcome                                                                                                                                       | Question number                                                                                                                                                                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9         | Identify the different phases of the Moon and Explains the features of different calendars (lunar, solar, and lunisolar) based on the periodic cycles. | 1,2,3,4,5,6,7,8,9,10,11,12,13, 14,15,16,17,18,19,20,21,22,23, 30,31,32,33,34,35,36,37,38,39,40, 41,42,43,44,45,46,47,49,50,51,52, 53,54,55,56,57,58,59,60,61,64,65, 66,67,68,69,70,71,72,73,74,75,76 77,78,79,80,81,82,83,84,85,86,87, 88,89,90,91,92,93,94,95,96,97,98, 99. |
| 10        | Explain the uses and importance of artificial satellites in understanding features beyond the earth                                                    | 24,25,26,27,28,29,48,62,63,                                                                                                                                                                                                                                                  |

#### Distribution of Questions Based on Difficulty

| Question Type          | Easy      | Average   | Difficult | Total     |
|------------------------|-----------|-----------|-----------|-----------|
| Multiple Choice (1m)   | 12        | 10        | 5         | 27        |
| Very Short Answer (1m) | 11        | 6         | 4         | 21        |
| Short Answer (2m)      | 3         | 8         | 4         | 15        |
| Long Answer (3m)       | 2         | 10        | 5         | 17        |
| Long Answer (4m)       | -         | 3         | 2         | 05        |
| Long Answer (5m)       | 1         | 7         | 6         | 14        |
| <b>Total</b>           | <b>29</b> | <b>44</b> | <b>26</b> | <b>99</b> |

#### Distribution of Questions Based on Objectives

| Questions              | Knowledge | Understanding | Application | Skill    | Total     |
|------------------------|-----------|---------------|-------------|----------|-----------|
| Multiple Choice (1m)   | 12        | 9             | 6           | -        | 27        |
| Very Short Answer (1m) | 10        | 7             | 4           | -        | 21        |
| Short Answer (2m)      | 3         | 6             | 6           | -        | 15        |
| Long Answer (3m)       | 4         | 8             | 5           | -        | 17        |
| Long Answer (4m)       | -         | 2             | 2           | 1        | 05        |
| Long Answer (5m)       | 1         | 5             | 5           | 3        | 14        |
| <b>Total</b>           | <b>30</b> | <b>37</b>     | <b>28</b>   | <b>4</b> | <b>99</b> |

**I Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet . (1mark)**

1. The day on which the Moon appears completely circular is called (easy)
  - A) New Moon Day (Amavasya)
  - B) Full Moon Day (Hunnime)
  - C) Half Moon
  - D) Eclipse
2. The main reason for the shape of the Moon changes every day is (easy)
  - A) The Moon has its own light
  - B) The shadow of the Earth
  - C) The change in the part of the Moon reflecting sunlight
  - D) Clouds
3. The illuminated part of the Moon gradually decreases and finally becomes completely invisible. This phase/period is called (easy)
  - A) Amavasya (New Moon)
  - B) Waxing period
  - C) Waning period
  - D) Hunnime (Full Moon)
4. The day on which the Moon is completely invisible is called: (easy)
  - A) Amavasya (New Moon)
  - B) Hunnime (Full Moon)
  - C) Half Moon
  - D) Eclipse
5. The period during which the illuminated part of the Moon increases is called: (easy)
  - A) Phases of the Moon
  - B) Waxing period
  - C) Waning period
  - D) Hunnime (Full Moon)
6. In India, the waning period of the Moon is known as: (easy)
  - A) Shukla Paksha
  - B) Krishna Paksha
  - C) Hunnime
  - D) Amavasya
7. In India, the waxing period of the Moon is known as: (easy)
  - A) Shukla Paksha
  - B) Krishna Paksha
  - C) Hunnime
  - D) Amavasya
8. The time interval from one Full Moon to the next Full Moon is: (easy)
  - A) 1 day
  - B) 1 month
  - C) 1 year
  - D) 15 days

9. If the Moon is in the western sky at sunrise, what day could it be **(easy)**  
A) Amavasya (New Moon)  
B) Poornima (Full Moon)  
C) Crescent Moon Day  
D) Gibbous Moon Day
10. We can only see the illuminated part of the Moon because: **(easy)**  
A) The Moon has its own light  
B) The Moon reflects the light of the Sun  
C) The light from the Earth shines on the Moon  
D) Light from the stars
11. To return to the exact same position in the sky, the Moon takes about more minutes every day. **(easy)**  
A) 30min  
B) 60min  
C) 10min  
D) 50min
12. The approximate time taken by the Moon to complete all its phases is: **(easy)**  
A) 24 hours  
B) 15 days  
C) 29.5 days  
D) 365 days
13. Which natural cycle forms the basis for measuring the unit of time called a "month"? **(easy)**  
A) Earth's rotation  
B) Cycle of the Moon's phases  
C) Change in the length of shadows  
D) Earth's revolution around the Sun
14. A solar year consists of these number of days. **(easy)**  
A) 354  
B) 360  
C) 365  
D) 295
15. The Gregorian calendar, which is widely used across the world today, is a type of **(easy)**  
A) Lunar calendar  
B) Solar calendar  
C) Sidereal calendar  
D) Roman calendar
16. The National Calendar of India is based on which of the following eras **(easy)**  
A) Vikram Shaka  
B) Shalivahana Shaka  
C) Christh shaka  
D) Hijri shaka
17. The first month of the Indian National Calendar is **(easy)**  
A) Vaishakha  
B) Kartika  
C) Chaitra  
D) Phalguna

18. Many Indian festivals are based on which type of calendar system **(easy)**  
A) Only Gregorian  
B) Lunar calendar  
C) Luni-solar calendar  
D) Roman calendar
19. In a Luni-solar calendar, what is added to reconcile the difference between the solar year and the lunar year **(easy)**  
A) Shunya Masa  
B) Adhika Masa  
C) Nakshatra Masa  
D) Soura Masa (Solar month)
20. The festival of Deepavali is celebrated on: **(easy)**  
A) Full Moon day of Kartika month  
B) New Moon day of Phalguna month  
C) New Moon day of Kartika month  
D) At the end of Ramzan month
21. The natural satellite of the Earth is **(easy)**  
A) Sun  
B) Moon  
C) Mars  
D) INSAT
22. We cannot directly observe the far side of the Moon using ground-based telescopes from Earth. What is the scientific reason for this? **(easy)**  
A) The far side of the Moon is always engulfed in total darkness.  
B) That part of the Moon never turns toward the Earth.  
C) There are no dust particles on the back side of the Moon to reflect light.  
D) The Earth's atmosphere blocks that light.
23. On a New Moon day, the Moon is not visible to us from Earth. Regarding the surface of the Moon at this time, which of the following statements is true? **( average)**  
A) The entire surface of the Moon is in darkness.  
B) Sunlight falls on the far side (hidden face) of the Moon.  
C) The Sun, Earth, and Moon are not in a straight line.  
D) The Sun, Earth, and Moon are in a straight line.
24. Artificial satellites have orbits at an altitude of approximately this kilometers from Earth. **(easy)**  
A) 100 km  
B) 500 km  
C) 800 km  
D) 1200 km
25. The time taken by an artificial satellite to complete one orbit around the Earth is **(easy)**  
A) 20 hours  
B) 100 minutes  
C) 50 minutes  
D) 10 hours
26. Which of the following is NOT a use of artificial satellites **(easy)**  
A) Weather forecasting  
B) Preventing earthquakes  
C) Television broadcasting

D) Communication and Internet

27. The full form of ISRO is (easy)

A) International Space Research Organisation

B) Indian Solar Research Organisation

C) Indian Space Research Organisation

D) International Solar Research Organisation

## II. Answer the following questions (One-Mark )

28. Who is considered as the Father of the Indian Space Programme? (easy)

29. Where is the Vikram Sarabhai Space Centre located? (easy)

30. Why does the Moon appear bright to us? (easy)

31. "What do you call the Moon changes shape every night? (easy)

32. What is the reason we always see only one side of the Moon? (easy)

33. What is meant by the different phases of the Moon? (easy)

34. If the Moon completely stopped rotating on its axis but continued to revolve around the Earth, would we still see only one face of the Moon? (easy)

35. What is a solar day? (easy)

36. The average duration of a day is approximately equal to how many hours? (easy)

37. What is another natural cycle found in nature that has a duration longer than a single day? (easy)

38. how much time does the Earth take to complete one full revolution around the Sun? (easy)

39. According to a lunar calendar, how many months are there in a year? (easy)

40. How many days does the month of February have in a leap year? (easy)

41. On what parameters is a Luni-solar calendar based? (easy)

42. When did the Government of India officially adopt the National Calendar? (easy)

43. In a normal year, on which date of the Gregorian calendar does the month of Chaitra begins? (easy)

44. What is the starting date of Chaitra month in a leap year? (easy)

45. When a leap year occurs in the Gregorian calendar, what change takes place in the starting date of the Indian National New Year? (easy)

46. "Why do Indian festival dates **change every year**?" (easy)

47. Name a festival that is determined based on the lunar calendar system. (easy)

48. Write any two uses of artificial satellites. (easy)

## III. Answer the following questions (Two-Mark )

49. Draw a diagram representing the waxing and waning periods of the Moon as seen from Earth. (average)

50. Explain how the Moon transitions from New Moon (Amavasya) to Full Moon (Hunime). (average)

51. If you observe a Full Moon today, after approximately how many days will you observe the next New Moon? (average)

52. Why do we always see the exact same side of the Moon from Earth?. (average)

53. What is the reason behind the stability of the Moon's orbital position? . (average)

54. What natural cyclic baselines can be considered to define the concepts of a "day" and a "month"? . (average)

55. Why don't the seasons fall in the exact same lunar months every year in a lunar calendar system? (average)

56. Why is a solar calendar much more useful for agricultural activities? . (average)

57. How is the numerical difference between a solar year and a lunar year synchronized? .(average)

58. State the importance of a Luni-solar calendar. . (average)

59. Write down the names of the first 6 months of the Indian National Calendar. . **(average)**
60. State the major similarities and differences between the Indian National Calendar and the Gregorian calendar. . **(average)**
61. What are the primary structural differences between a lunar calendar and the Gregorian calendar? . **(average)**
62. What are artificial satellites? Describe how they move around the Earth. . **(average)**
63. Differentiate between a natural satellite and an artificial satellite. . **(average)**

**IV. Answer the following questions (Three-Mark )**

64. "Even though the Moon has no light of its own, it provides light to the Earth during the night." Justify and support this statement from a scientific perspective. **(Difficult)**
65. Suppose the Moon suddenly stopped revolving around the Earth. write down what changes you would observe in the phases of the Moon. . **(Difficult)**
66. How can accurately identify and track the varying positions of the Moon in the night sky? . **(difficult)**
67. Why does the Moon appear noticeably different to us on different days of the month? .**(Difficult)**
68. Explain how the relative positions of the Sun, Earth, and Moon give rise to the different phases of the Moon. . **(Difficult)**
69. If the Moon stopped rotating on its own axis completely but continued its revolution around the Earth, what changes would be visible in our view of the Moon from Earth? Explain with reasons. . **(Difficult)**
70. On a New Moon day, the Moon appears completely dark to observers on Earth. Does this mean the entire surface of the Moon is dropped into darkness at that time? Justify your answer. .**(Difficult)**
71. the duration of March 23 is recorded as 24.00 hours, while the duration of March 24 is recorded as 23.59 hours. What causes this slight difference, and what effect does it have on the calculated average length of a day? . **(Difficult)**

| Date          | Time of shortest shadow (hh:mm) | Duration of day (hh:mm) |
|---------------|---------------------------------|-------------------------|
| 22 March 2025 | 12:20                           | —                       |
| 23 March 2025 | 12:20                           | 24:00                   |
| 24 March 2025 | 12:19                           | 23:59                   |
|               |                                 |                         |

72. Explain how ancient civilizations might have systematically used the phases of the Moon to construct their calendars. . **(Difficult)**
73. Explain how the lengths of months are structured and organized within a solar calendar. . **(Difficult)**
74. How luni-solar calendar different from Solar calendar. . **(Difficult)**
75. List the primary structural features and scientific characteristics of the Indian National Calendar. .**(Difficult)**
76. The meteorological department issues a warning stating, "A severe cyclone will hit coastal areas within the next 48 hours." Analyse the critical role played by artificial satellites in making this prediction. . **(Difficult)**
77. How is ISRO utilizing artificial satellite technology to aid the progress and development of the agricultural sector? **(Average)**

78. Ravi said, "At sunset, I saw a crescent moon rising in the east." Kausalya said, "Once at noon, I saw a gibbous moon in the east." Who among the two is telling the truth? Provide an analytical answer (Average)
79. If we completely stop accounting for leap years in our tracking of time, after approximately how many years will India's Independence Day (August 15) fall during the winter season? Explain your calculations. (Difficult)
80. On a specific night, Vaishali tracked the Moon in the sky continuously from sunset to sunrise. Which phase of the Moon did she observe? Support your answer with a proper explanation. (Average)

**V. Answer the following questions ( Four Mark )**

81. Draw the structural changes that occur in the appearance of the Moon as it transitions from Full Moon to New Moon (Average)
82. Using the above reference diagram answer the following sub-questions: (Difficult)
- 1) Did the Moon look different every single day?
  - 2) Was the Moon visible on all days of the cycle?
  - 3) Did the Moon appear in the exact same spot in the sky as the previous day?
83. Explain how and why the Moon rises and sets at entirely different times compared to the Sun throughout the month. (Difficult)
84. As the New Moon approaches, the Moon appears closer to the Sun. Why does the illuminated part of the Moon seen from Earth keep shrinking during this time?" (Difficult)
85. Describe a simple hands-on activity or experiment that can help students clearly understand the different phases of the Moon. (Difficult)
86. Based on the sunrise and sunset data provided below, how can you practically prove the scientific statement that "the average duration of a day is 24 hours"? (Difficult)

| Date          | Time of shortest shadow (hh:mm) | Duration of day (hh:mm) |
|---------------|---------------------------------|-------------------------|
| 22 March 2025 | 12:20                           | —                       |
| 23 March 2025 | 12:20                           | 24:00                   |
| 24 March 2025 | 12:19                           | 23:59                   |
|               |                                 |                         |

87. What is a leap year? Explain why and how it is mathematically integrated into a solar calendar system. (Difficult)
88. "The Luni-solar calendar system in Indian culture is highly scientific." Support and justify this statement with your answer. (Difficult)
89. The National Calendar of India is framed entirely on scientific and astronomical foundations. Write an explanatory note supporting this statement. (Difficult)
90. Observe the 1947 calendar data shown in Figure below Create a clear table showing how the number of days varies across different months of the National Calendar. (Difficult)

| Shaka Era 1947                         |                  |                  |                  |                  |                  |                                       |                  |                  |                  |                  |                  |                                     |                 |                  |                  |                  |                  |
|----------------------------------------|------------------|------------------|------------------|------------------|------------------|---------------------------------------|------------------|------------------|------------------|------------------|------------------|-------------------------------------|-----------------|------------------|------------------|------------------|------------------|
| Chaitra<br>(March 22 - April 20, 2025) |                  |                  |                  |                  |                  | Vaisakha<br>(April 21 - May 21, 2025) |                  |                  |                  |                  |                  | Jyestha<br>(May 22 - June 21, 2025) |                 |                  |                  |                  |                  |
| SUN                                    | MON              | TUE              | WED              | THU              | FRI              | SAT                                   | SUN              | MON              | TUE              | WED              | THU              | FRI                                 | SAT             | SUN              | MON              | TUE              | WED              |
| रवि                                    | सोम              | मंगल             | बुध              | गुरु             | शुक्र            | शनि                                   | रवि              | सोम              | मंगल             | बुध              | गुरु             | शुक्र                               | शनि             | रवि              | सोम              | मंगल             | बुध              |
|                                        |                  |                  |                  |                  |                  | 1 <sub>22</sub>                       | 1 <sub>21</sub>  | 2 <sub>22</sub>  | 3 <sub>23</sub>  | 4 <sub>24</sub>  | 5 <sub>25</sub>  | 6 <sub>26</sub>                     |                 | 1 <sub>22</sub>  | 2 <sub>23</sub>  | 3 <sub>24</sub>  |                  |
| 2 <sub>23</sub>                        | 3 <sub>24</sub>  | 4 <sub>25</sub>  | 5 <sub>26</sub>  | 6 <sub>27</sub>  | 7 <sub>28</sub>  | 8 <sub>29</sub>                       | 7 <sub>27</sub>  | 8 <sub>28</sub>  | 9 <sub>29</sub>  | 10 <sub>30</sub> | 11 <sub>31</sub> | 12 <sub>1</sub>                     | 13 <sub>2</sub> | 4 <sub>26</sub>  | 5 <sub>27</sub>  | 6 <sub>28</sub>  | 7 <sub>29</sub>  |
| 9 <sub>30</sub>                        | 10 <sub>31</sub> | 11 <sub>1</sub>  | 12 <sub>2</sub>  | 13 <sub>3</sub>  | 14 <sub>4</sub>  | 15 <sub>5</sub>                       | 14 <sub>3</sub>  | 15 <sub>4</sub>  | 16 <sub>5</sub>  | 17 <sub>6</sub>  | 18 <sub>7</sub>  | 19 <sub>8</sub>                     | 20 <sub>9</sub> | 11 <sub>22</sub> | 12 <sub>23</sub> | 13 <sub>24</sub> | 14 <sub>25</sub> |
| 16 <sub>6</sub>                        | 17 <sub>7</sub>  | 18 <sub>8</sub>  | 19 <sub>9</sub>  | 20 <sub>10</sub> | 21 <sub>11</sub> | 22 <sub>12</sub>                      | 21 <sub>10</sub> | 22 <sub>11</sub> | 23 <sub>12</sub> | 24 <sub>1</sub>  | 25 <sub>2</sub>  | 26 <sub>3</sub>                     | 27 <sub>4</sub> | 18 <sub>22</sub> | 19 <sub>23</sub> | 20 <sub>24</sub> | 21 <sub>25</sub> |
| 23 <sub>13</sub>                       | 24 <sub>14</sub> | 25 <sub>15</sub> | 26 <sub>16</sub> | 27 <sub>17</sub> | 28 <sub>18</sub> | 29 <sub>19</sub>                      | 28 <sub>18</sub> | 29 <sub>19</sub> | 30 <sub>20</sub> | 31 <sub>21</sub> |                  |                                     |                 | 25 <sub>23</sub> | 26 <sub>24</sub> | 27 <sub>25</sub> | 28 <sub>26</sub> |
| 30 <sub>20</sub>                       |                  |                  |                  |                  |                  |                                       |                  |                  |                  |                  |                  |                                     |                 |                  |                  |                  |                  |

91. Classify the various festivals mentioned in the textbook .

based on the specific lunar months and lunar days on which they are celebrated. **(Average)**

92. Today, we can sit at home and watch live telecasts of cricket matches happening in any distant corner of the world. Explain the underlying satellite communication mechanisms that make this possible. **(Average)**

93. Imagine a scenario where all operational artificial satellites in space suddenly stop working at once. write down the immediate consequences this would have on our daily lives. **(Difficult)**

94. Amol was born on a Full Moon day on May 6. Will his birthday fall exactly on a Full Moon day every subsequent year? Explain your answer. **(Difficult)**

95. Prove mathematically that over a 3-year period of a solar calendar, a total of 37 Full Moons will occur, ensuring that at least two Full Moons must happen within the exact same calendar month at some point (Blue Moon phenomenon). **(Difficult)**

96. Scientific studies show that the Moon is gradually moving far away from Earth, and its orbital speed is slowing down. Explain whether this means a Luni-solar calendar will require the addition of an extra month (Adhika Masa) more frequently or less frequently in the distant future. **(Difficult)**

97. Malini observed the Moon directly overhead exactly at sunset. **(Difficult)**

1) Draw the shape of the phase of the Moon that Malini observed.

2) Is this moon currently in its waxing phase or its waning phase?

## VI. Answer the following questions **(Five-Mark )**

98. State whether the following statements are True or False, and provide a clear scientific reason for each conclusion: **(Difficult)**

1) We can only see that portion of the Moon which reflects sunlight directly toward us.

2) Phases of the Moon are caused because the Earth's shadow blocks sunlight from reaching the Moon's surface.

3) Calendars are systematically built upon predictable, repeating astronomical cycles.

4) The Moon can only ever be seen during the night.

99. Observe the lunar images labelled A to F in Figure and answer the following questions: **(Difficult)**



Fig. 11.11

1) Match each labelled image (A, B, C, etc.) to its corresponding time index in the lunar cycle

| Phase of Moon              | Picture label (e.g. A, B, C, etc.) |
|----------------------------|------------------------------------|
| Three days after New Moon  |                                    |
| Full Moon                  |                                    |
| Three days after Full Moon |                                    |
| One week after Full Moon   |                                    |
| New Moon Day               |                                    |

2) List the labels of the lunar phases that can never be seen directly from Earth.

(Hint: Use your observations from Activity 11.1 or Figure 11.2 as a reference baseline).

## CHAPTER 12

### How nature works in harmony

| LO number | Learning outcome                                                                                                                                                                                                                                                                                                              | Question number |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <b>12</b> | Identify the components of environment and analyze the inter relationship between these components with particular illustrations; Integrate the importance of formation of food chains and food webs in the ecosystem to bring sustainability in the environment. Define and explain the biological terms related to ecology. | <b>1 to 43</b>  |

#### Weightage to difficult level

| Questions               | Easy      | Average   | Difficult | Total     |
|-------------------------|-----------|-----------|-----------|-----------|
| <b>MCQ</b>              | <b>6</b>  | <b>6</b>  | <b>3</b>  | <b>15</b> |
| <b>1 Mark questions</b> | <b>3</b>  | <b>5</b>  | <b>2</b>  | <b>10</b> |
| <b>2 Mark questions</b> | <b>5</b>  | <b>4</b>  | <b>5</b>  | <b>14</b> |
| <b>3 Mark questions</b> | <b>-</b>  | <b>1</b>  | <b>1</b>  | <b>02</b> |
| <b>4 Mark questions</b> | <b>-</b>  | <b>-</b>  | <b>2</b>  | <b>02</b> |
| <b>5 Mark questions</b> | <b>-</b>  | <b>-</b>  | <b>-</b>  | <b>-</b>  |
| <b>Total</b>            | <b>14</b> | <b>16</b> | <b>13</b> | <b>43</b> |

#### Weightage to objectives and different types of the questions

| Questions               | knowledge | Understanding | Application | Skill    | Total     |
|-------------------------|-----------|---------------|-------------|----------|-----------|
| <b>MCQ</b>              | <b>6</b>  | <b>7</b>      | <b>2</b>    | <b>-</b> | <b>15</b> |
| <b>1 Mark questions</b> | <b>6</b>  | <b>4</b>      | <b>-</b>    | <b>-</b> | <b>10</b> |
| <b>2 Mark questions</b> | <b>5</b>  | <b>5</b>      | <b>4</b>    | <b>-</b> | <b>14</b> |
| <b>3 Mark questions</b> | <b>-</b>  | <b>2</b>      | <b>-</b>    | <b>-</b> | <b>02</b> |
| <b>4 Mark questions</b> | <b>-</b>  | <b>1</b>      | <b>1</b>    | <b>-</b> | <b>02</b> |
| <b>5 Mark questions</b> | <b>-</b>  | <b>-</b>      | <b>-</b>    | <b>-</b> | <b>-</b>  |
| <b>Total</b>            | <b>17</b> | <b>19</b>     | <b>7</b>    | <b>-</b> | <b>43</b> |

**I. Choose the correct answer for the following incomplete statements/questions and write the answers along with its letter of the alphabet (1 mark)**

1. In the following this state of India elephants often enter fields and villages? **(Easy)**
  - A. Tamil Nadu
  - B. Kerala
  - C. Karnataka
  - D. West Bengal
2. Identify the factors that affect the growth of plants **(Average)**
  - A. Changes in rainfall and temperature
  - B. Temperature
  - C. Weather
  - D. Wildfire
3. The type of paths that wildlife ecologists have identified to allow safe movement of animals in many parts of the country **(Average)**
  - A. Directional path
  - B. Traffic path
  - C. Footpath
  - D. Airway
4. An example of habitat **(Easy)**
  - A. Tree
  - B. Soil
  - C. Forest
  - D. Sky
5. Identify and write the biological unit found in the habitat of lakes **(Easy)**
  - A. Stone
  - B. Feather
  - C. Fish
  - D. Deer
6. The colored parts found in a flower **(Average)**
  - A. Stamen
  - B. Sepals

C. Petals

D. Ovary

7. The foods dragonflies usually eat **(Easy)**

A. Flies

B. Ants

C. Gnats

D. Mosquitoes

8. In an ecosystem, organisms interact with the following inorganic components **(Difficult)**

A. For reproduction

B. Shelter

C. For growth

D. For water

9. An example of a terrestrial ecosystem is **(Easy)**

A. Lake

B. Pond

C. Forests

D. Sea

10. An essential element required for plants to produce food **(Easy)**

A. Sunlight

B. Sulfur

C. Chlorine

D. Hydrogen

11. Identify the bird that migrates to Jodhpur district of India during the winter months **(Difficult)**

A. Demoiselle stork

B. Duck

C. Pigeon

D. Parrot

12. An example for a decomposer is **(Difficult)**

A. Bacteria

B. Virus

C. Algae

D. Insects

13. The frog species was exported from India in the 1980s **(Average)**
- A. Bull frog
  - B. Hill frog
  - C. Sea frog
  - D. Soil frog
14. The Indian wildlife scientist helped in understanding the relationships between animals in the forest ecosystem **(Average)**
- A. R. K. Laxman
  - B. Asir Jawahar Thomas John Singh
  - C. Leonardo
  - D. Michael John
15. Identify the forest that has the largest mangrove forests in the world **(Average)**
- A. Sundarbans forests
  - B. Amazon forests
  - C. Gir forests
  - D. Green forests

**II. Answer the following questions (one mark questions)**

16. Why do elephants sometimes enter their nearby fields or gardens? **(Average)**
17. What are the benefits of pathroads? **(Easy)**
18. What are the components of our environment? **(Easy)**
19. What is biodiversity? **(Average)**
20. What is habitat? **(Easy)**
21. Write the classification of organisms found in a habitat. **(Average)**
22. What is biodiversity? **(Average)**
23. What is pollination? **(Difficult)**
24. For which functions are plants and animals dependent on each other? **(Difficult)**
25. Mention two types of ecosystems found in nature. **(Average)**

**III. Answer the following questions (two mark questions )**

26. List the living and non-living things found in this habitat. **(Average)**
27. What are the requirements of fish from lakes? **(Easy)**
28. What are the different factors that cause competition among organisms of the same species? **(Easy)**

29. What are the biological components found in a community of a habitat? (Average)
30. What is photosynthesis? What are the substances required for photosynthesis in plants? (Easy)
31. List the differences between herbivores and carnivores. (Easy)
32. What are omnivores? Give examples of such organisms. (Easy)
33. Draw a food chain found in a grassland ecosystem. (Average)
34. What are trophic levels? Which are the organisms found at the first trophic level in a food chain? (Average)
35. What is a food web? (Difficult)
36. What is biodegradation? Give examples for decomposers. (Difficult)
37. What are the consequences of farmers using more pesticides in agricultural activities? (Difficult)
38. For which resources do organisms compete in an ecosystem? What is the benefit of this? (Difficult)
39. State the differences between symbiosis and parasitism. (Difficult)

#### **IV. Answer the following questions (three mark questions)**

40. List the living and non-living things found in the following habitats (Average)
- a. Lake    b. Forest
41. Write one example for each of the reactions that can occur in a habitat. (Difficult)
- a. Reaction between biotic and abiotic components
- b. Reaction between two abiotic components
- c. Reaction between biotic components

#### **V. Answer the following questions (four mark questions)**

43. List the various organisms of plant and animal classes found in the habitat of lakes. (Difficult)
44. What are the reproductive parts found in the flowers of a plant? What is the process of mating of these parts called? What are the factors that help in carrying out this mating process? (Difficult)

## Chapter 13

### Our Home: Earth, a Unique Life Sustaining Planet

| LO number | Learning outcome                                                                                                                                                                    | Question number                                                                                                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13        | Explain the special features of the Earth that support life in the different layers of the Earth (atmosphere, hydrosphere, lithosphere and biosphere) and their interrelationships. | 1,2,3,4,5,6,7,8,9,10,11,12,13, 16,17,18,19,20,21,22,23,24,25, 26,27,28,30,31,37,38,39,40,41,42, 43,44,45,46,47,48,50,51,52,53,54, 55,56,57,58,60,61,62,66,67,68,69, 71,72,73,74,76,79,80,82,83 |
| 14        | Explain the types of reproduction; the importance of biodiversity; the challenges faced by life on Earth.                                                                           | 14,15,29,31,32,33,34,35,36, 49,59,62,63,64,65,70,75,77, 78,81,84                                                                                                                               |

#### Distribution of questions based on difficulty

| Question type         | Easy | Average | Difficult | Total |
|-----------------------|------|---------|-----------|-------|
| Multiple choice (1m)  | 6    | 6       | 3         | 15    |
| Very short answer(1m) | 5    | 15      | 3         | 23    |
| short answer(2m)      | 3    | 6       | 6         | 15    |
| Long answer(3m)       | 3    | 6       | 7         | 16    |
| Long answer(4m)       | 0    | 4       | 6         | 10    |
| Long answer(5m)       | 0    | 4       | 1         | 5     |
| Total                 | 17   | 41      | 26        | 84    |

#### Distribution of question based on objectives

| Questions type        | Knowledge | Understanding | Application | Skill | Total |
|-----------------------|-----------|---------------|-------------|-------|-------|
| Multiple choice (1m)  | 4         | 6             | 5           | 0     | 15    |
| Very short answer(1m) | 8         | 9             | 6           | 0     | 23    |
| Short answer(2m)      | 4         | 5             | 6           | 0     | 15    |
| Long answer(3m)       | 4         | 6             | 5           | 1     | 16    |
| Long answer(4m)       | 1         | 3             | 5           | 1     | 10    |
| Long answer(5m)       | 1         | 2             | 2           | 0     | 5     |
| Total                 | 22        | 31            | 29          | 2     | 84    |

**I. Four alternatives are given for each of the following questions/incomplete statements. choose the correct alternative and write the complete answer along with its letter of alphabet.**

1. The only planet in the solar system known to support life. **(Easy)**
  - A. Mercury
  - B. Earth
  - C. Venus
  - D. Jupiter
2. This one is the major reason for the Mars not to currently support life like on Earth **(Average)**
  - A. It has too many volcanoes.
  - B. It is too close to the Sun.
  - C. It lacks a thick atmosphere and liquid water.
  - D. Its magnetic field is too strong.
3. If Earth were smaller with the same density, what might happen to its atmosphere? **(Difficult)**
  - A. It would become thicker and hotter.
  - B. It would escape into space due to weaker gravity.
  - C. It would become frozen.
  - D. It would cause stronger winds.
4. Mars' atmosphere is approximately this times thinner than that of the Earth. **(Average)**
  - A. 10 times
  - B. 100times
  - C. 1000 times
  - D. 10000 times
5. The hottest planet in the Solar System. **(Average)**
  - A. Mercury
  - B. Earth
  - C. Venus
  - D. Jupiter.
6. This planet is known as the Blue Planet **(Easy)**
  - A. Neptune
  - B. Jupiter
  - C. Venus

D. Earth

7. The planet in the Solar System that has no atmosphere at all. **(Average)**

A. Saturn

B. Venus

C. Earth

D. Mercury

8. Number of oxygen atoms present in an ozone molecule. **(Easy)**

A. One

B. Two

C. Three

D. Four

9. Gas released during photosynthesis is **(Easy)**

A. Hydrogen

B. Oxygen

C. Nitrogen

D. Carbon dioxide

10. Approximate percentage of Earth's surface covered by water is **(Easy)**

A. 30%

B. 50%

C. 60%

D. 70%

11. Ponds, lakes, rivers, springs, seas, oceans, and groundwater together form the **(Easy)**

A. Hydrosphere

B. Atmosphere

C. Lithosphere

D. Biosphere.

12. This is an example of geodiversity **(Average)**

A. Variety of bird chirping in a forest.

B. Different landforms like mountains, valleys, and deserts.

C. Changing weather during monsoons.

D. Number of different types of fishes in a pond.

13. Cutting forests can affects the following **(Average)**

1. Water cycle 2. Soil 3. Air quality and animals living there 4. Fossil fuels

A. 1 only

B. 1 and 2 only

C. 1, 2 and 3 only

D. 1, 2, 3 and 4

14. In sexual reproduction, the gametes produced by a parent contain, **(Difficult)**

A. Half of the parent's genetic material.

B. same of the parent's genetic material.

C. Double the parent's genetic material.

D. Four times the parent's genetic material.

15. The reason for the offspring to be different from their parents in sexual reproduction is**(Difficult)**

A. They grow in different climates.

B. They eat different food.

C. They acquire new instructions after birth.

D. They get mixed instructions (genes) from both parents.

**II. Answer the Following questions (1 Mark )**

16. In which layer of Earth are all the mountains, rivers, forests, animals, and people are found?  
**(Easy)**

17. From where do all planets in the Solar System get their energy? **(Easy)**

18. Which is the closest planet to the Sun in the Solar System? **(Easy)**

19. What is the Habitable Zone or Goldilocks Zone? **(Average)**

20. Which planet lies at the edge of the Sun's habitable zone, but has shown no proof of life?  
**(Average)**

21. State the function of the ozone layer. **(Average)**

22. A freely suspended magnet always settles in a fixed direction. Why? **(Average)**

23. Which liquid is known as the universal solvent? **(Easy)**

24. What is a magnetic field? **(Average)**

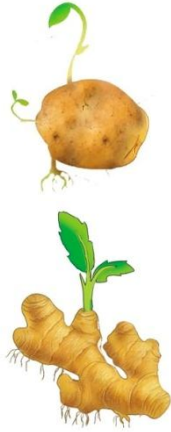
25. What causes Earth's magnetic field? **(Difficult)**

26. What is the solar wind? **(Difficult)**

27. What is the process of photosynthesis? **(Average)**

28. What is the geosphere? **(Average)**

29. What is biodiversity? (Average)
30. What is the most important step needed to keep Earth healthy for the future? (Average)
31. What is the unit that transfers hereditary instructions from parents to offspring? (Easy)
32. What are the two major types of reproduction? (Average)
33. Observe the pictures and identify the type of reproduction. (Average)



34. What is pollination? (Average)
35. What is fertilization? (Average)
36. After fertilization, which parts of a flower develop into the seed and the fruit? (Difficult)
37. What is climate change? (Average)
38. What is environmental pollution? (Average)

### III. Answer the Following Questions (2 Marks)

39. Name the planets in their increasing order of distance from the Sun in our solar system. (Average)
40. Which planets in the Solar System are relatively small and rocky? (Average)
41. Which planets are large and mainly composed of gases? (Difficult)
42. Why is Venus hotter than Mercury even though Mercury is closer to the Sun? (Difficult)
43. Why is Earth called the Blue Planet? (Easy)
44. What is the advantage of Earth's nearly circular orbit around the Sun? (Difficult)
45. What are cosmic rays? (Average)
46. Explain the importance of Earth's magnetic field. (Difficult)
47. What are the main requirements for photosynthesis? (Easy)
48. Explain the importance of water in animals. (Average)
49. Differentiate between asexual and sexual reproduction. (Difficult)

50. What are the three major environmental challenges facing Earth today? (Average)

51. What are greenhouse gases and what causes their increase? (Average)

52. Observe the picture and identify the type of pollution. (Easy)



A



B

53. After the monsoon, you notice small green plants growing in cracks in your school wall. Where do you think the seeds came from? What conditions helped these plants grow there? (Difficult)

#### IV. Answer the Following Questions (3 Mark)

54. Explain the advantages of images obtained from satellite.. (Average)

55. What is the greenhouse effect? What important role does it play on Earth? (Average)

56. Explain the dangers posed by cosmic rays and solar wind particles. (Difficult)

57. Imagine Earth's magnetic field suddenly disappeared. What kinds of problems could arise for life on Earth? Explain. (Difficult)

58. Explain the importance of Earth's crust. (Average)

59. What is the biosphere? Which parts of Earth does it include? (Average)

60. Observe the picture and explain its importance (Difficult)



61. what are the constituents of Biosphere? **(Average)**
62. Explain the importance of reproduction. **(Difficult)**
63. Small changes can occur in the genetic informations passed from parents to offspring. Explain the advantages of such changes and give an example. **(Difficult)**
64. What is vegetative reproduction? Give an example. **(Average)**
65. Draw a longitudinal section of a flower and label. **(Easy)**
- a. Anther
- b. Ovule
66. Explain the harmful effects of the greenhouse effect. **(Average)**
67. Name the types of environmental pollution. **(Easy)**
68. A friend says, "The Earth has always had climatic changes in the past, so today's global warming is nothing new." how would you respond using what you've learn in this and other chapters of your science book? **(Difficult)**
69. Explain the causes and harmful effects of air pollution. **(Average)**

#### **V. Answer the Following Questions (4 Mark)**

70. Explain the major reasons why Earth strongly supports life. **(Average)**
71. Earth is at the right distance from the Sun. What would happen if it were much closer or much farther away? **(Difficult)**
72. Earth has the right size in the Solar System. What might happen if Earth were much smaller or much larger? **(Difficult)**
73. Sketch and label the layers of Earth showing its internal structure. **(Average)**
74. Explain the significance of the Mars Orbiter Mission (Mangalyaan) launched by Indian Space Research Organisation and the importance of Mars exploration. **(Average)**
75. Explain the importance of sexual reproduction. **(Difficult)**
76. Discuss how water pollution and soil pollution are serious threats to living organisms. **(Average)**
77. Recently, a city cleared a large forest area to build roads and buildings. Discuss the possible effects on local climate and biodiversity. How could this affect water availability and quality in the region? **(Difficult)**
78. In a village, temperatures have been increasing and rainfall has become unpredictable over several years. What might be causing these changes? Suggest two ways the village can adapt to these new conditions. **(Difficult)**
79. If Earth had no atmosphere, explain how it would affect life, temperature, and water on the planet. **(Difficult)**

**VI. Answer the Following Questions (5 Mark)**

80. What factors make Earth a unique planet? (Average)

81. State the type of asexual reproduction found in the following organisms. (Average)

1. Bacteria

2. Amoeba

3. Algae

4. Hydra

5. Planaria

82. What measures should we take to protect life on Earth? (Average)

83. You have been given the responsibility of designing a new human settlement on Mars. Name three things from Earth that you would need to recreate to support human life. Which of these would be the most difficult to recreate, and why? (Difficult)

84. Discuss five examples of vegetative reproduction. (Average)

# ANSWERS

## CHAPTER - 1

### Exploring the investigative world of science

#### Answers

#### I

1. D) Tiny-particles
2. C) Gas
3. D) Mixtures
4. C) Refraction of light
5. A) Microscope
6. C) Gravitational force
7. B) Electric Motor
8. C) Water Heater
9. B) Vaccine
10. A) Infection
11. B) Strong difference in pressure
12. A) Small difference in pressure

#### II. ONE MARK ANSWER

13. The Living organisms that cannot be seen with the naked eye are called micro organisms
14. Working of electric motors.
15. Iron box, Toaster, Water heater.
16. A ball falls to the ground because of the pull of the Earth's gravitational force.
17. The stronger atmospheric pressure difference is the causes for weather events like storms and cyclones.
18. A small difference in pressure causes a gentle cool breeze to blow, whereas a strong difference in pressure creates a cyclone and storms.
19. Solutions are formed by the homogeneous mixture of solutes and solvents.
20. By watching the periodic cycles of the Moon's phases, humans initially created the calendars.
21. All living organisms existing together in the environment are collectively called biodiversity. (From microscopic organisms to the massive blue whale).
22. The atmospheric Ozone layer.
23. The water molecules present in the dough rapidly turn in to steam
24. The phenomenon of bending of light ray when it passes from one medium to other is called refraction of light.

### III. TWO MARK ANSWERS:

25. Microbes helpful for digesting of food.  
Used to prepare vaccines/medicines.  
Useful for preparing food through fermentation process.
26. It causes infection in the human body.  
Infection brings illness.  
They cause infectious diseases.
27. Eating nutritious food.  
Daily exercise and yoga  
Being cautious and alert against infections.
28. Maintenance of hygiene.  
Use of medicines and vaccines
29. The heating effect of electric current is useful in manufacturing bulbs, water heaters, iron boxes, and toasters.
30. In a solid state, particles are tightly arranged.  
Particles cannot move much.  
The attractive force between particles is high

31.

| Solid                            | Gas                                      |
|----------------------------------|------------------------------------------|
| Particles are tightly arranged   | Particles are arranged very loosely      |
| Attractive force is high.        | Attractive force is almost non-existent. |
| Movement of particles is minimal | Movement of particles is high            |

32. Particles are loosely arranged compared to solids.  
The attractive force between particles is less.  
Particles possess greater movement
33. Elements  
Compounds  
Mixtures
34. Elements: Made up of a single type of atom and are pure.  
Compounds: Made up of different types of atoms and are impure.
35. Depending on the relative positions of the Earth, Moon, and Sun, The different parts of the Moon is illuminated, which cause for the Moon is appearing in various shapes.
36. Helps to keep us healthy.  
Helps to fight against infection.
37. The pressure of water vapor becomes equal to the atmospheric pressure. To balance this, 100°C is necessary for boiling.

#### IV. THREE MARKS ANSWERS:

38. Living organisms

Air

Water

Sunlight

Temperature and pressure.

39. Due to human activities:

Changes occur rapidly in the temperature on Earth.

Environmental ecosystems lose their balance.

Environmental pollution occurs, leading to hazardous consequences.

The ozone layer gets depleted, creating problems for living organisms by the UV rays.

40. Observation of environmental ecosystems.

Understanding the inner mechanisms of ecosystems.

Identifying and controlling the elements causing environmental imbalance.

Controlling factors that have an adverse impact on the environment.

41. Asking questions.

Observing and analyse the answers.

Conducting experiments and understanding the results.

42.

A) Every object is made up of fundamental particles, which cannot be divided further.

b) A substance formed by the combination of two or more elements in a definite proportion.

c) A combination that can be physically separated are called mixtures.

## CHAPTER 2

### THE INVISIBLE LIVING WORLD : BEYOND OUR NAKED EYE.

#### **I**

1. B. Microscope
2. C. Microorganisms
3. A plastid
4. B neuron
5. A. Egg
6. B Microorganism
7. A amoeba
8. C. Algae
9. B. Fungus
10. D. Fungus
11. C. Virus
12. C. Bacteria and Fungus
13. A. Methane
14. C. Rhizobium
15. B. Spirulina
16. D. 10,00,000
17. A. Lactobacillus

#### **II.**

18. Organisms are made up of simple units or building blocks called cells.
19. Glycerin
20. Basic unit of life
21. The cells in our cheeks are cuboid (polygonal)-like structures.
22. Three layers of cells, a thin outer layer called cell membrane, a central region called nucleus, and in between them is the cytoplasm.
23. The nucleus controls all the activities that take place inside the cell.
24. Cell wall
25. Neurons carry messages in our bodies.

26. Because the vacuole in plant cells help to store essential substances, remove waste products, and maintain the shape of the cell.

27. Organisms that are too small to be seen with the naked eye are called microorganisms.

28. Organisms made up of only one cell are called unicellular organisms.

29. Bacteria and fungus

30. Methane

31. ( 1 ) To cook

( 2 ) To generate electricity

32. Bacteria do not have a specific nucleus or nuclear membrane. Instead, they have a nucleoid.

### III.

33. Cells have three main parts. The outer layer is surrounded by the cell membrane, the central part is the nucleus, and the space between the cell membrane and the nucleus is filled with cytoplasm.

34. ( 1 ) The cell membrane surrounds the cytoplasm and nucleus.

( 2 ) The cell membrane separates one cell from another. It has microscopic pores and allows the passage of substances necessary for life processes.

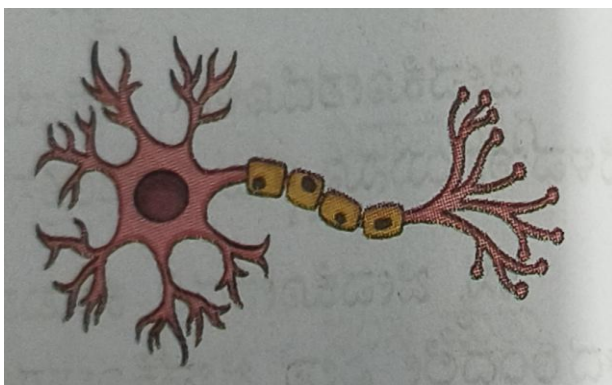
35. Cellular material contains compounds such as carbohydrates, proteins, fats, and mineral salts. These help in carrying out most of the vital functions.

36. Muscle cells, nerve cells, fat cells, blood cells, gametes

37.

| Muscle cell    | Nerve cell              |
|----------------|-------------------------|
| *spindle shape | *Long structures        |
| *Has branches  | *Does not have branches |

38

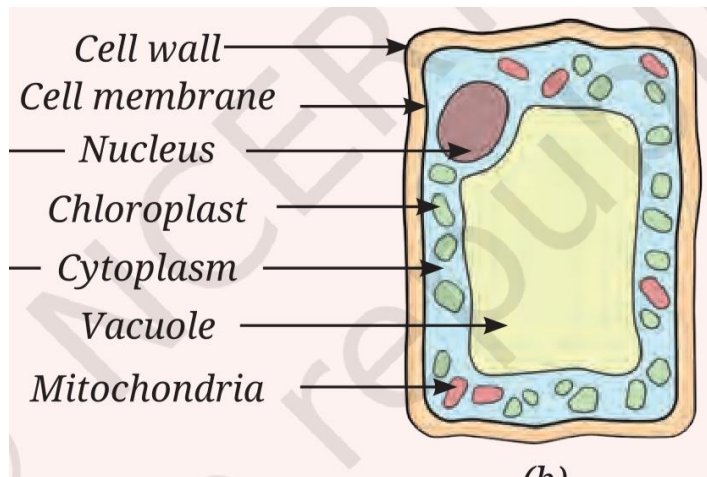


39. The basic unit of life is the cell. A group of cells that have a similar structure and perform a specific function together is called a tissue.

40. Cell---- →Tissue--- →Organ--- →Organ system-- →Organism

41. Humans are complex organisms , starting from a single cell called an 'egg' and having the amazing ability to divide again and again to form a complete organism made up of many cells, hence humans are called multicellular organisms.

42.



43. Protozoa, algae, fungi and bacteria

44. Cotton-like structures found on foods such as tomatoes and oranges indicate the growth of microorganisms. This is a fungus, which grows easily in the presence of moisture and air.

45. Bread mold (fungus), mold (fungus), algae, bacteria

46.

| Bacteria                      | Fungus                                                       |
|-------------------------------|--------------------------------------------------------------|
| * Are single-celled organisms | Most are multicellular organisms, only a few are unicellular |
| *No specific nucleus present  | There will be a clear nucleus.                               |

47.

| Unicellular organism                      | Multicellular organism       |
|-------------------------------------------|------------------------------|
| Made up of only one cell                  | Made up of many cells        |
| A single cell performs all the functions. | Cells function individually. |

48. Take a tomato or an orange, put some fruits in the refrigerator, and some fruits in the freezer . After a few days, you can see the growth of microorganisms like cotton on the fruits that are outside. But no microorganisms are found on the fruits that are in the refrigerator. This tells us that the right temperature and humidity are necessary for the growth of microorganisms.

49. Lactobacillus bacteria are the microorganisms that help curdle milk. When curd is left out at room temperature, the bacteria in the curd releases more lactic acid. This makes the curd more sour.

#### IV.

50.\* Some microorganisms make their own food. In doing so, they release oxygen and produce more than half of the Earth's oxygen supply.

\*Lactobacillus bacteria curdle milk.

\*Some algae are used as health supplements and some as medicines.

51.\*Take an onion bulb and remove the thin, transparent layer (onion skin) from its inner surface.

\*Place this onion peel in a petri dish with a few drops of safranin for 30 seconds. This will give the cell a pink color and help it to be seen clearly.

\*Now carefully place the stained onion peel on the glass slide using a thin brush.

\*If you place a drop of glycerin on the ciliated membrane on a slide and observe it through a microscope, you will see closely packed, almost rectangular structures (cells).

52.

| Plant cell                        | Animal cell                |
|-----------------------------------|----------------------------|
| *Has a cell wall                  | Has a cell membrane        |
| *The food vacuole will be larger. | The food vacuole is small. |
| * Plastids are present            | Plastids are absent.       |
| * Lysosomes not found.            | Lysosome is present        |

53. Plants have plastids in all parts of the plant , which help them to look green and perform photosynthesis. Plant cells have large, food vacuole that help the plant store materials and remove waste. However, animal cells do not have plastids to perform photosynthesis , and vacuoles are usually absent in animal cells. If they do, they are small. Therefore, plant and animal cells are made up of different cells, each structure helping to perform its own specialized function.

54. Different parts of the digestive system are made up of different types of cells. A group of muscle cells is found in the (food pipe) oesophagus. These cells push food into the stomach through a wave-like movement of contraction and expansion. This type of movement is possible because the muscle cells are thin , flexible, and spindle-shaped . The stomach also has different types of cells to

perform different functions. Muscle cells in the stomach wall help to push food through. Other cells in the stomach lining produce digestive juices and acid, which help to break down food. All these cells work together to make digestion happen.

55. If there were no microorganisms on Earth ,

- \*Dead plants and animals were not decomposed

- \*Without nutrients reaching back to the soil , plant growth would have completely stopped.

- \* Without the good bacteria in the human gut, digestion and immunity would be compromised.

56. Many microorganisms, such as bacteria and fungi , live in an oxygen-free environment. Some of these bacteria are capable of breaking down plant and animal waste in the environment. In the process, they release a mixture of gases containing carbon dioxide and high proportion of methane.

57. ( A) Bacteria

- (A ) fungi

- (C ) Bacteria (Rhizobium)

58. In an animal cell

- \*Nucleus

- Only in bacterial cells

- \*Nucleoid

- Only in plant cells

- \*Cell wall

- \*Chloroplast

59. Bread kept in the refrigerator is safe to eat without any microbial growth. But bread kept near the sink first absorbs moisture and then in two to three days you can see green or black hair-like structures growing on it. This is the growth of fungi. If kept like that for a few days, it releases harmful chemicals.

V.

60. Generally, pollution in the environment is caused by the waste of plants and animals and their dead bodies. This causes permanent pollution if it does not decompose in the environment. However, soil contains various types of microorganisms. Some microorganisms like fungi and bacteria act on the waste and slowly break it down into simple, nutrient-rich manures. Therefore, microorganisms can be said to be the cleaners of the environment.

61. yeast is a type of the microorganisms called fungi . Yeast grows well in warm environments. Like other organisms, yeast also respire and breaks down food to get the energy they need for growth and life. In this process, carbon dioxide is released. This creates bubbles. This makes the dough fluffy and become soft. In this process, a small amount of alcohol is also produced. This gives

the dough a slightly different smell. This special property of yeast is used in the process of making breads , cakes and other things. Along with yeast, some bacteria like Lactobacillus help in fermenting the dough to make idlis and dosa.

62.

|                                                        | Name of the microorganism | Task                                                                                     |
|--------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------|
| Organism in curd                                       | Lactobacillus bacteria    | Curdles milk.                                                                            |
| Microorganism found in the roots of legume plants      | Rhizobium bacteria        | Absorbs nitrogen from the air and makes it useful to plants                              |
| An organism used in the preparation of bakery products | Yeast                     | Helps in fermentation and softens the dough used in the preparation of bakery products . |
| Decomposers in the environment                         | Bacteria and fungus       | They decompose plant and animal waste.                                                   |

63. It can be observed that the milk in bowl A has turned into curd after a few hours and is slightly sour. But the milk in bowl B is not curd. However, it may be slightly sour. This is because curd contains many types of bacteria. One of them is Lactobacillus. This bacteria consumes the sugar in the milk, multiplies. And ferments the milk to form curd. These bacteria grow well in a warm environment. That is why curd is formed in bowl A and not in bowl B.

64. \*Take an empty container and fill it with water. Fill the container halfway with garden soil. Add some fruit and vegetable peels to this container and then spread a layer of soil on top of it.  
\*After 2 to 3 weeks, you will see that the peels of fruits and vegetables have turned into a dark colored substance.

\* Soil contains a variety of microorganisms . Microorganisms such as fungi and bacteria act on plant waste and slowly break it down into simple, nutrient-rich manures

\*Organic manures prepared in this way is rich in nutrients and helps increase soil fertility.

65. A) Since there is yeast in flask A, fermentation takes place and carbon dioxide gas is released.

B)The carbon dioxide released in flask A reaches tube B and causes precipitation.

(C) Fermentation would not have taken place, carbon dioxide would not have been released.

66. Fungi - Branched filaments without chlorophyll have a small sac-like structure.

Mould- branched filaments without chlorophyll Brush like structure

Algae:spherical ,presence of chlorophyll. –a green pigment

Bacteria: sphericle , comma -shaped, spiral or rod shaped long hair -like structure and many small hair-like projections around the cel

## CHAPTER.3.

### Health: The Ultimate Treasure

#### I. Multiple choice answers:

1. B) Balance between body, mind, and the surroundings
2. B) Getting adequate sleep
3. C) AQI
4. A) Cancer
5. A) Malaria
6. B) Cholera
7. D) Tuberculosis
8. C) Liver
9. B) India
10. A) Cowpox
11. B) Intestine
12. C) Tuberculosis
13. C) Malaria
14. A) Edward Jenner
15. B) Dr. Maharaj Kishan
16. A) Rotavirus
17. B) Protozoa and Virus
18. A) Alexander Fleming
19. A) 1928
20. B) Fungi

#### II. ONE MARK ANSWERS

21. Being physically, mentally and socially well integrated is called health.
22. WHO = World Health Organisation
23. Increases the body's internal temperature.
24. AQI = Air Quality Index
25. Redness of skin, skin rash, swelling of infected parts..
26. Microorganisms that cause infections and diseases are called pathogens.
27. There are two types of diseases are:  
Infectious/Communicable diseases,  
Non-infectious/Non-communicable diseases.
28. The diseases that are not caused by infections are called non communicable diseases.
29. Diabetes and Cancer.
30. Insects carries disease-causing pathogens / microorganisms to our bodies.
31. Organisms that depend on other organisms for their food and shelter are called parasites.
32. Tuberculosis and Leprosy.
33. The ability of the body to fight against diseases and pathogens is called immunity (disease-resistant power).
34. Administering / taking a vaccine.
35. Vaccines prevent diseases but they do not cure them.
36. Protects children from diarrhea.
37. Prevents bacterial infections.

- Inhibits the growth / spread of bacteria in the body.
38. The phenomenon where a bacteria that earlier killed by an antibiotic are found to survive and multiply in the body is called antibiotic resistance.
39. Dr kamal Ranadive discover how hormones and certain viruses are linked in the prevention and treatment of cancer

### **III. TWO MARK ANSWERS**

40. Habits  
Lifestyle  
Surrounding environment.
41. Mobile usage, watching digital screens.  
Eating fast food,  
Low-nutrient food,  
Sleeping late and waking up late.  
Skipping morning breakfast.
42. Stagnant water containing fields that facilitate breeding of mosquitoes.  
They increase the spreading of communicable diseases to nearest people.
43. Common cold, Covid-19, Cough, Asthma diseases.
44. They target parts of bacterial cells that are different from human or other animal cells.
45. Maintaining self hygiene  
Living in a clean environment,  
Regular exercise.  
Getting good sleep.  
Spending time with family and friends.  
Having a positive mindset,  
Laughing and joyful life with like-minded people.
46. Pain  
Fatigue,  
Dizziness,  
Vomiting,  
Fever,  
Skin redness, swollen joints.
47. Bacteria, Viruses, Fungi, Protozoa and worms.
48. The diseases that spread from an infected person to other person are called communicable diseases..  
Example: Cholera, Malaria.
49. Communicable / Infectious: Typhoid, Malaria, Dengue, Covid-19, Chickenpox .  
Non communicable/Non-infectious: Cancer, Diabetes.
50. Unhealthy food habits, Lifestyle, Diet.  
Lack of physical activity,  
Eating high-calorie and junk food,  
Eating processed food.

51.

| <b>Communicable</b>                | <b>Non communicable</b>          |
|------------------------------------|----------------------------------|
| Infectious diseases                | Non-infectious diseases          |
| Spreads from one person to another | Does not spread                  |
| Caused by pathogens                | Caused by lifestyle, food habits |

52. Personal hygiene

Good habits,  
Use nutrient-rich food,  
Drinking boiled water,  
Taking vaccines.

53. A) Protozoa, B) Roundworms.

54. Diseases caused by the deficiency of specific nutrients in food.

Example: Scurvy, Anemia, Goiter. Night blindness.

55. Hormonal imbalance,

Unhealthy eating habits.  
Lack of physical activity,  
Using excessive calorie junk food.

56. Frequent urination,

Excessive thirst.  
Weight loss.  
Tiredness.  
Slow healing of wounds.

57. When a vaccine is administered, the body develops immunity against the targeted disease.

Our body identifies pathogenic microorganisms and attacks them.

58. Prepared from weak or dead pathogens like viruses or bacteria.

Vaccines are prepared from the inactive parts of a pathogen.

59. Tetanus injection provides protection against the bacteria responsible for tetanus.

It contains inactivated toxin of the bacteria and provides defense against the disease.

60. Exposure through animal food products.

Rearing of some animals in home only.

61. No need to give antibiotics to cattles

Cattle will develop antibiotic resistance.

62. Ayurveda, Siddha and unani systems.

63. Vaccines protect human from pathogens and diseases.

They also control spreading of diseases.

#### **IV. THREE MARK ANSWERS**

64. Meditation and yoga.

Good sleep.  
Practice of mindfulness  
Consumption of adequate fruits and vegetables as food.  
Processed fat foods should not be consumed.

65. Screen time should be limited, and more time should be spent in nature.  
Activities like walking, running, cycling, and exercise should be done.  
Adequate sleep should be taken to provide rest to the body and mind.  
Simple breathing exercises like Yoga and Pranayama should be done.  
One should stay away from intoxicating substances like tobacco and alcohol
66. All infectious diseases are caused by pathogens.  
They enter the body through the air we breathe.  
Pathogens enter the body through the consumption of contaminated food and water.  
They spread through the air when an infected person coughs or sneezes.  
They spread by sharing the personal items of an infected person.  
Some pathogens are spread by insects like mosquitoes and flies.
67. Variolation is a traditional method of treatment.  
A small amount of material should be taken from the sores of a person suffering from smallpox.  
This should be introduced by scratching the skin of a healthy person to cause a mild infection.  
Immunity against the disease is created in the body due to the infection.
68. When antibiotics are given, they kill the disease causing bacteria.  
Antibiotics also kill the good bacteria present in the body.  
Antibiotic-resistant bacteria grow, and they transfer resistant property to other bacteria as well.
69. Antibiotics should be used only when prescribed by doctors.  
They must be used in the right dosage and for the right duration.  
Antibiotics should be used discreetly/judiciously.  
Unnecessary use of antibiotics should be avoided.

#### **V. FOUR MARKS ANSWERS:**

70.

| Disease      | Pathogen | Site of infection |
|--------------|----------|-------------------|
| Common Cold  | Virus    | Lungs             |
| Tuberculosis | Bacteria | Lungs             |

71.

| Disease | Pathogen | Site of infection |
|---------|----------|-------------------|
| Measles | Virus    | Skin and lungs    |
| Cholera | Bacteria | Intestine         |

72.

| Disease       | Pathogen | Site of infection |
|---------------|----------|-------------------|
| Hepatitis - A | Virus    | Liver             |
| Typhoid       | Bacteria | Intestine         |

73. Surrounding areas must be kept clean.

Practice basic hygiene procedure.

Wash hands with soap.

Cover your mouth and nose when coughing and sneezing.

Wear a mask in crowded places.

Towels and hand kerchiefs should not be shared with others.

Food and water at home must be kept clean.

Take rest when feeling uncomfortable during disease.

74. It spreads to other patients directly or through health care workers while an infected person is receiving treatment.

It spreads from patients to others within the hospital environment.

It spreads to family members when patients return home.

75.

| Disease      | Symptoms                                              |
|--------------|-------------------------------------------------------|
| Influenza    | Nasal congestion, sore throat, fever and cough        |
| Tuberculosis | Cough, fever, fatigue, loss of appetite night sweats. |

76. spread

| Disease | Symptoms                                         |
|---------|--------------------------------------------------|
| Cholera | Diarrhea and dehydration                         |
| Malaria | High fever, profuse sweating<br>Periodic chills. |

## VI. FIVE MARK ANSWERS

77.

More dengue cases found during the months of July, August, September.  
During these above-mentioned months, it is the rainy season, the humidity is high, and disease-carrying vectors breed more.

78. **Control of Infectious/Communicable Diseases:**

The school premises and playground must be kept clean.  
Measures taken to ensure that water does not stagnate on the school playground.  
Maintenance of personal hygiene.  
Provision of pure drinking water.  
Clean and hygienic mid-day meals.  
Students who are unwell/sick should wear a mask.

**Control of Non-Communicable Diseases:**

Exercise  
Yoga  
Meditation and Sports/Games activity.

79. Should use blankets

Should carry Clothes that cover the entire body.  
Mosquito nets and mosquito repellents should be carried.  
Wear a mask in crowded places.

80. Smoking is injurious to health

Smoking causes cancer.  
Respiratory-related diseases occur.  
It affects the functioning of the heart.  
It affects on the function of kidneys.  
It affects the nervous system.  
It affects the functions of the reproductive organs.

## CHAPTER- 4

### Electricity: Magnetic and Heating Effects

#### I

1. B. A magnetic field is produced around the wire.
2. C.Hans Christian Oersted
3. A. Electric bell
4. B. Temporary magnet
5. C. Soft iron
6. D. Placing an iron nail at the centre of a coil
7. B. Switch
8. C. Dry cell
9. B. Copper
10. C.Weak conductors
11. C. Bulb
12. B. Statement 2 is correct
13. C. To make and break an electrical circuit.
14. B. The strength of the magnetic field increases
15. B. Heating effect of electric current
16. C. Electrical resistance
17. A. High resistance
18. C. Nichrome
19. B. Hair dryer, electric kettle, electric bulb
20. D. Metal with high conductivity
21. C. High temperature furnace
22. D. Electric bulb
23. D. Voltaic cell
24. A Single use cell
25. C. Both a and b are correct
26. B.Produces more heat for a given current
- 27 D.In all four electric circuits

28. B. Dry cell, Rechargeable cell, Voltaic cell

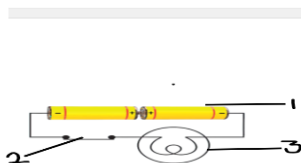
## II

29. A magnet is a substance that attracts objects like iron.

30. A magnet has its own permanent magnetic field, but iron has a temporary magnetic field only when it comes into contact with an electric current.

31. When electricity flows in an electrical circuit, the compass needle deflects.

32. 1. Battery      2. Switch      3. electric bulb



33. Magnetic effect of electric current

34. An electric bell works on the principle of the magnetic effect of electric current.

35. A crane is a device that has electromagnets that lift

36. When electricity flows in a wire, a magnetic field is produced around the wire.

37. Sumana's argument is correct. Because the motor of a mixer rotates due to the presence of an electromagnet.

38. An iron nail is changing into a temporary magnet.

39. If a 1.5 V dry cell is used in an electrical circuit instead of a 9 V battery, the strength of the electromagnet will decrease. This is because as the electric current decreases, the magnetic field generated around the conductor also decreases. Hence the deflection of magnetic needle decreases.

40. When electric current flows in a conductor wire, the conductor wire heats up. This is called the heating effect of electric current.

41. When electricity flows through any conductor, that metal causes an obstacle or obstruction to the flow of electricity. Then some electrical energy is lost in the form of heat. This is called as resistance.

42. The SI Unit of resistance is Ohm

43. In heat generating devices like electric stoves, electric kettles etc., there are wires or coils. These coils glow red when electricity flows and generate heat. This is called the heating element.

44. The device shown in the figure is a water-heating immersion coil.

45. A metal with a high resistance generates more heat. Therefore, a metal with a high resistance is installed in the heating unit.

46. Material B is suitable for a room heater.

47. An electric cell is a device that converts chemical energy into electrical energy.

48. The liquid used in a voltaic cell is a weak acid or a salt solution.

49. Metal plates are good conductors of electricity. Therefore, electrodes are made of metal plates.

50. Since the electric lamp is not lit in the electric circuit, we can conclude that there is no current flowing.

51. The given component is electric cell. Deflects An electric cell is the source of energy that makes electricity flow in the electric circuit.

### III

52. Suman's argument is correct because the motor works on the principle of electromagnet.

53. Objects that are attracted by a magnet are called magnetic objects. An example is iron.

54. The four effects of electric current are magnetic effect, heating effect, mechanical effect and chemical effect.

55. When electricity flows in a conductor, a magnetic field is generated around that conductor. This is the magnetic effect of electric current.

56. When electricity flows through a wire, a compass needle is placed near It deflects indicating that there is a magnetic field around the wire.

57. The attractive zone around a magnet is called a magnetic field. When electricity flows in an electric conductor, a magnetic field is also generated.

58. When electricity flows through a tubular coil, it acts like a magnet and deflects the pointer of the compass. When an iron nail is placed in the middle of the coil, the coil becomes an even more powerful magnet. This is an electromagnet.



59. An iron nail acts like a magnet, only when electricity flows in the coil of a conductor around an iron nail. When the power is cut off, it loses its attractive force. Therefore, an electromagnet is called a temporary magnet.

60. When the number of cells is increased or the number of turns of an electric coil is increased, the magnetic field generated in the electromagnet increases.

61. Electric bells, motors, fans, loudspeakers.

62. The poles of the electromagnet can be changed by changing the ends of the conductors connected to the electromagnet with the terminals of the battery.

63. When electricity flows through any conductor, the resistance of that conductor causes an obstacle to the electric current. The electrical energy of the wire is lost in the form of thermal energy. The conductor heats up. This is the heating effect of electric current.

64. When electricity flows through an electric bulb, the metal filament installed in it glows brightly due to its high resistance, converting the electrical energy into light energy.

65. Electric stove, electric iron, electric room heater, electric kettle

66. Due to the heating effect of electric current, sometimes energy loss can occur in the wires during power transmission. Plugs and sockets can be damaged due to overheating of the equipment. Its plastic parts can melt or fire accidents can occur.

67. Using electric cells or batteries, a small electric lamp can be lit, an electromagnet can be made or a wire can be heated.

68. A battery is a combination of several electric cells. A battery can supply a larger amount of electricity than an electric cell.

69. After the chemicals in the electric cells that work in the electrical circuit are completely used up, the electric cell gradually stops working. This is called a dead cell. Therefore, electricity cannot be supplied.

Examples of dead cells are the voltaic cell and the dry cell.

70. A voltaic cell consists of plates made of two different metals and a chemical solution, which are placed in a glass or plastic container. The two plates are partially immersed in the solution. This chemical solution is usually a weak acid or salt solution. This is called the

71 Some common metal pairs used in voltaic cells are zinc/copper, zinc/silver, aluminum/copper, iron/copper, magnesium/copper, lead/copper

72. Dry cells are one of the most widely used electric cells. These are called dry cells because the electrolyte in them is in the form of a thick, moist paste rather than a liquid. A dry cell has a carbon rod as the positive terminal and zinc as the negative terminal.

73. A dry cell is better than a voltaic cell because the electrolyte used in it is in the form of a thick, moist paste rather than a liquid, so there is no leakage. It is easy to maintain and small in size.

74. Rechargeable batteries are electrochemical cells that can be recharged with the help of electrical energy and reused. This prevents wastage of resources and provides a long service life.

75. Devices that operate with rechargeable batteries include mobile phones and laptops.

76. Example of a rechargeable battery is Lithium ion battery

## IV

77



As shown in the figure, the ends of a conductor wire should be connected to an electric cell through a switch. When the switch is pressed, the electric compass deviates in a specific direction. From this, it can be concluded that when electricity flows in the conductor, a magnetic field is generated around the conductor. Now when the switch is opened, the compass comes to a standstill. This shows that there is no magnetic field. Now when the ends of the conductor are exchanged with the opposite

poles of the battery, the deviation of the compass occurs in the opposite direction to the first attempt. This shows that the direction of the magnetic field changes.

78. As shown in the figure, wrap a flexible wire with an insulating coating about 50 cm long around an iron nail several times, tightly and secure it with an adhesive tape. Connect the ends of the wire to the electric cell. Be careful not to let the current flow for more than 30 seconds. Otherwise, the electric cell may weaken quickly. Now bring the nail close to the iron paper clips. The clips will stick. Now stop the flow of electric current in the wire. Observe whether the paper clips fall down. This experiment shows that electromagnets are temporary magnets.

A) If Suman forget to turn off the switch of the electromagnet, the current would flow in the conductor coil for a long time and the electrical energy would be lost in the form of heat. Due to this, the magnetic field of the electric current decreases and the paper clips are not attracted. But the wire wrapped around the iron nail will be hot.

79. Electric heat generation methods are more convenient than traditional heat generation methods because

1. Electric stoves do not cause air pollution.
2. The efficiency of the electric stove is high.
3. The cost of fuel is low.
4. It is eco friendly.
5. Gases like carbon dioxide and carbon monoxide are not released.
6. It occupies less space.
7. Easy to transport and maintain.

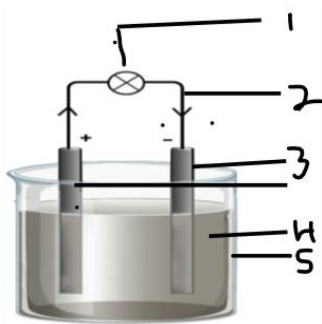
80. Yes, the coil will deflect the compass needle even after the iron nail is removed. When electricity flows through the coil, a magnetic field is created around it and it behaves like an electromagnet. If an iron nail is inserted into the coil, the strength of the magnet increases. When the iron nail is slid out, the compass will deflect less. This is because the electromagnet formed by the conductor coil alone is weak. When the ends of the electric coil are connected with the opposite poles of the battery by switching, the direction of the magnetic field changes and the compass will deflect in the opposite direction.

## V.

81. As shown in the figure, place two nails at a distance of 5 cm, stretch a nichrome wire between them and connect it with the battery and the switches. Turn on the switch for about 30 seconds and then move it back to the off position and touch the nichrome wire for a moment. You will know that the nichrome wire is hot.

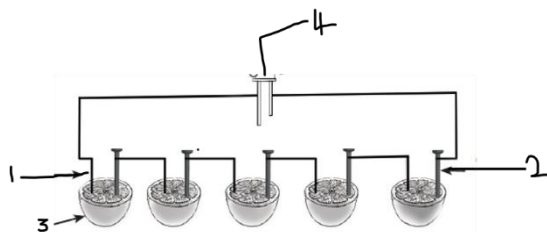
This happens because when electricity flows through any conductor, the conductor has to face some obstacle or resistance. Different conductors offer different levels of resistance to the flow of electric current. For example, nichrome wire has a higher resistance compared to copper wire of the same size and length. Due to this, nichrome wire heats up more in a short time.

82.



1. Electric bulb
2. Contact wire
3. Electrodes
4. Electrolyte
5. Glass beaker

83.



- 1.copper plate
- 2.iron nail,
- 3.electrolyte
4. LED lamp

## VI

84. a. The heating element is usually made of nichrome and the contact wires are made of copper.
- b. Since the resistance of the contact wire is low, it does not heat up.
- c. Usually the heating element is made of metals or alloys with high resistance, so it heats up quickly.
- d. The reason for the heating element is in the shape of a coil is that the length of the conductor in the coil is greater. As the length of the conductor increases, the electrical resistance also increases. This generates more heat.
- e. By using a connection wire with an insulating coating, no electrical accidents occur and no electricity leaks.

85. 1. Dry cell

2. Electric bulb

3.Switch

4.Connecting wire

5. Battery

## CHAPTER 5.

### EXPLORING FORCES.

#### Key answers

#### I.

1. B.Force
2. C. Newton
3. B. The ball changes direction .
4. B. opposite
5. A. will be higher
6. B repels
7. C static charges
8. B. repels
9. A attracts
- 10.B static electric force
- 11.A Because the Earth has gravitational force
12. D is an attractive force
13. C increases
14. A decreases
15. D weight.
- 16 B. Newton
17. A .0 to 10
18. C . 10 Newton
19. D. Density of matter
20. B.  $W_1 > W_2 > W_3$
- 21 .B. sinks

#### II

22. The push or pull that occurs when one object interacts with another object is called force.
23. Opening a desk drawer , stretching a rubber band
24. This means that the forces acting on that object are balancing each other.
25. Contact force and non-contact force
- 26.Newton

27. Forces that act only when there is physical contact between objects are called contact forces.
28. Muscular force, friction force
29. The force produced by the action of muscles is called muscular strength.
30. Hitting a moving ball with a bat , pulling the box with the help of a rope.
31. At least two things must interact with each other .
32. Traditional transport , pulled by a horse, and for ploughing
33. When one object moves over the surface of another or the force acting when trying to move.
34. Friction always acts in the direction opposite to the direction in which the object is moving or trying to move.
35. The force of friction is caused by two surfaces in contact.
36. Friction is greater on rough surfaces.
37. A force can make an object to move
38. Some forces can be felt even when objects are not in contact with each other. Such forces are called non-contact forces.
39. Magnetic force, electrostatic force
40. The force exerted by a magnet on another magnet or a magnetic material is called magnetic force.
41. Iron, nickel
42. The force exerted by a charged body on another charged or uncharged body is called electrostatic force.
43. North Pole and South Pole
44. When two objects made of certain materials are brought into contact with each other , electric charges accumulate on their surfaces. These charges are called stationary electric charges.
45. Positive charge, negative charge
46. The force by which the Earth attracts objects towards itself is called gravity.
47. All objects fall towards the Earth because the Earth attracts them .
48. The force with which the Earth attracts an object is called the weight of the object.

### III.

49. (1 ) The direction of a moving ball changes.  
(2 ) The shape of the ball changes.
50. (1) Friction is a contact force.  
(2) The force of friction acts in the direction opposite to the direction in which the object is moving.  
(3) The force of friction helps an object to come to rest.

(4 ) Friction is greater on irregular surfaces. acts in the direction opposite to the direction in which the object is moving or trying to move and is caused by two surfaces in contact, so it is called the contact force.

52. ( 1) moved quickly on the table

(2 ) Friction is more in sand.

53. Some objects are designed in specific shapes to reduce the frictional force caused by the air or water around them when they are moving at high speed.

54.

| Contact strength                                     | Contactless force                          |
|------------------------------------------------------|--------------------------------------------|
| 1. There must be direct contact between the objects. | No connection is required between objects. |
| 2.Ex: Muscle force, friction force                   | Ex: Magnetic force, electrostatic force    |

55.

\* Take two ring magnets and a wooden stick.

on a wooden table and attach a ring magnet to the stick.

\* Now add the second ring magnet on top of it so that the like poles of the magnets face each other. Make sure that the second magnet floats on the first magnet.

\*If you try to slowly push the second magnet down, you will feel a force on it.

A magnet exerts a force on another magnet from a distance without coming into contact with it . That is called contactless force.

56. While walking on an tar road, there is less friction , so you can walk easily. However, when u walk on sand, there is more friction, so walking feels difficult.

57. Pulling and pushing of iron objects, if we use the muscle power we require many people . Instead, if contactless strong magnetic force is used, iron objects can be pulled and pushed easily.

58. If there were no gravity , humans, animals, and all things would be floating in the air, unable to stand on the ground. There would be no atmosphere. This would mean there would be no oxygen.

59.

| Weight                                                                        | Mass                              |
|-------------------------------------------------------------------------------|-----------------------------------|
| 1. Weight is the gravitational force with which the Earth attracts an object. | The amount of matter in an object |
| 2. unit: Newton                                                               | Unit : kilogram                   |
| 3. Weight varies from place to place                                          | The mass does not change.         |

60. Because friction is the force that resists motion between two surfaces, it provides grip on rough ground, but on icy or shiny ground, friction is very low, making it slippery.

61 Yes, in non- uniform motion, an external force is applied , the velocity of an object changes with time. When there is a change in velocity, there is an acceleration. Therefore, if there is to be an acceleration , there must definitely be an effect of a force.

IV.

62. Muscle strength plays a vital role in many functions within our body. This strength helps us chew food and push food through the digestive tract during digestion. The contraction and expansion of the heart muscles allows blood to circulate in our body.

63.

| Muscle strength                                    | Frictional force                                                                                    |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Caused by the action of our muscles                | The force that opposes the motion of two objects when their surfaces are in contact with each other |
| It makes things move.                              | It resists movement.                                                                                |
| The energy we put into it works in that direction. | It acts in the opposite direction of the object's motion.                                           |

64. \*Take an empty plastic bottle and a bucket filled with water.

\*Push the bottle into the water and release the bottle.

\*You will feel an upward push and the bottle will bounce to the surface of the water.

\*This indicates that the water exerts a force in the upward direction on the bottle.

\*In fact , all liquids exert a similar force.

\*The force exerted by a fluid on an object in an upward direction is called upward pressure or buoyant force.

\*A liquid exerts its buoyant force in an upward direction. If the force of gravity is greater than the buoyant force, the object sinks.

65. A coin is made of metal. The density of metal is greater than the density of water, so the coin sinks in water. Wood has small air chambers inside it. Therefore , the density of wood is less than the density of water, so the coin sinks.

66. The gravitational force on the surface of the moon is much less than the gravitational force on Earth . No, the mass of an object does not change on the moon or on any other planet. It remains the same on Earth.

V.

67. \*Take two ring magnets and a wooden stick.

\*Hold a stick vertically on a table and attach a ring magnet to the stick.

\* Now, add a second ring magnet on top of it so that the like poles of the magnets face each other. Add the second magnet on top of the first magnet. The second magnet will appear to float on the first magnet .

\* Try to gently push both ends of the rope.

\* Now, reverse the poles of both magnets. The second magnet will still float.

this activity, you can learn that one magnet can exert a force on another magnet without coming into contact with it .

68. When two objects of certain materials are brought together , electric charges accumulate on their surfaces. These charges are called static electric charges because they do not move on their own. An object that has a static charge is called a charged object. A charged object attracts. That is, it exerts a force on uncharged objects of certain materials, such as small pieces of paper. This force occurs even when the objects are not in contact.

69.

| Magnetic force                                                                    | Static electric force                                                                  |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Magnets cause friction.                                                           | Caused by electrical charges                                                           |
| Operates between the North and South Poles                                        | Operates between positive and negative charges                                         |
| The intensity of magnetic fields decreases very rapidly with increasing distance. | The electrostatic force is inversely proportional to the distance between the charges. |
| Not much affected by changes in the surrounding medium                            | The intensity of the force changes with a change in the medium.                        |

70. Friction always acts in the opposite direction to the direction in which an object is moving or trying to move. In many cases, friction can be beneficial. For example , friction is essential for stopping moving vehicles and friction is necessary when striking a match. Sometimes friction is disadvantageous. Yes, friction causes rapid wear of machine parts and can sometimes lead to fire accidents.

71. \*Weight can be measured using string time .

\*This scale has N from 0 to 10.

. \* The difference between 0 and 01N or between 01 N and 02 N is 1 N.

are 5 sections between the large lines and the small lines .

\*A small division can be read as  $01\text{N} / 5 = 0.2\text{N}$  so the minimum value that a string balance can read is 0.2N

72. ( i ) In the case of its upward motion:

The force of gravity always acts downward on the ball. This is a force caused by air friction and acts against the motion of the ball, i.e. downwards.

(ii) In case of its downward movement:

This too is always downward due to the force of gravity.

(iii ) At its highest point:

Even if the ball stops for a moment, the force of gravity does not change and it continues to act downward, causing the ball to fall back down again.

73. ( i ) To stop before point A:

the ball and the surface must be high. If the surface is made too rough, the ball will quickly lose speed and stop before reaching point A.

(ii) Stop after crossing point A :

If the surface is made smoother, friction will decrease, so the ball will travel farther and stop after passing point A.

74. The effects of a force applied to an object are:

\*.An object can be made to move from a state of rest.

\*If an object is moving, its velocity can be changed.

\*The direction of motion of an object can be changed.

\*Can bring about a change in the shape of an object

\*May cause some or all of these effects

V.

75. Complete the table.

| Serial No. | Action                                 | Push/pull | Effect                                  |
|------------|----------------------------------------|-----------|-----------------------------------------|
| 2.         | When a moving ball is hit with a stick | Pulling   | Changing the direction of a moving ball |
| 2.         | Pressing an inflated balloon           | Push      | Change in the shape of the balloon      |
| 3.         | Stretching a rubber band               | Pulling   | The shape of the rubber band changes.   |

I

76. ( i ) Take some objects of different masses like a string pencil box, lunch box and a small stone.

( ii) Hang one end of the string from a nail. Hang an object from the other end and observe the string.

( iii) Now hang the other objects one by one and observe the stretch in the string each time.

(iv) It can be observed that the expansion caused by each material is different.

(v) When an object is suspended from a string, the string stretches due to the force exerted by the Earth on the object. We find that the stretching effect on the string is different for different objects. This indicates that the Earth attracts different objects with different forces .

77. Two balloons with the same charge repel each other, but a charged balloon and a piece of wool attract each other. This means that the charge on the balloon is of a different type than the charge on the piece of wool. Since the balloons are charged in the same way, we can say that they have acquired the same type of charge. When balloons with the same charge repel each other, we can conclude that the same type of charges repel each other. Both the rubbing object and the rubbed object become charged. But they acquire opposite types of charges. The attraction between them shows that opposite charges attract each other.

## CHAPTER- 6

### PRESSURE,WINDS,STORMS AND CYCLONES.

#### Key answers

#### I. Multiple Choice Questions

1. A. Force
2. C. Gravitational force
3. C. Reduce the pressure
4. C. Newton
5. B. Area
6. A.  $25 \text{ N/m}^2$
7. C. Height of the column
8. B. Cyclone
9. A. Amphan
10. B. Indian Meteorological Department

#### II. One Mark Questions

11. Force per unit area is called as pressure
12. pressure depends upon
  - a. Force b. Area
13.  $\text{Pressure} = \frac{\text{Force}}{\text{Area}}$
14. SI unit of pressure is Pascal
15. The envelope of air surrounding the earth is called atmosphere.
16. The atmospheric air contains nitrogen,oxygen,argón,carbon dioxide and other gasses in small quantities.
17. The pressure exerted by air around us is known as the atmospheric pressure.
18. air in motion, caused by differences in air pressure within the Earth's atmosphere causes wind at sea
19. spinning system of clouds, winds and rain is called a cyclone.
20. eye of the cyclone.

### III. Two Mark Questions

21. A. India -- Monsoon

B. Philippines--- typhoons

C. Japan---typhoons

D. America --hurricane

22. Effects of force

- a. Force can change an object's speed, direction of its motion, or both.
- b. Force can change the shape of an object.

23. To reduce the pressure for holding the bag.

24. The reason we are not crushed under this weight is that the pressure inside our bodies is also equal to the atmospheric pressure. This balances the pressure exerted from outside.

25. A low pressure area develops above the sea. As a result, wind blows from the land to the sea, giving rise to land breeze.

26. When we press the sucker, most of the air between its cup and the surface on which it is placed is pushed out and the air pressure inside it is reduced. The sucker sticks to the surface because the pressure of air surrounding the sucker is higher than the pressure exerted by the air inside the sucker.

27. High-speed winds exert immense pressure on flat surfaces. If hanging banners and billboards are completely solid, the wind pressure can easily tear them down or break their supports. Holes are made so that the air can pass through them smoothly, significantly reducing the wind pressure acting on the banner.

28. 1. Do not take shelter under an isolated or tall tree. If you are in a forest, take shelter under a small tree. 2. Avoid sitting inside a car with open windows or touching metallic objects. Stay away from open water bodies.

29. Monsoon winds are seasonal winds that change direction with the seasons. They are crucial because they bring the rains essential for Indian agriculture.

30. The intensity and destruction caused by a cyclone depend primarily on the following three atmospheric factors:

- 1. Wind Speed and Direction: High-speed winds determine the destructive force of the storm, capable of toppling trees, houses, and electric poles.
- 2. Temperature: Warm sea surface temperatures (above 27°C) act as the primary fuel source, providing the thermal energy required to sustain the storm.
- 3. Humidity: High moisture content in the air provides the water vapour necessary for cloud formation and the release of latent heat during condensation.

#### IV. Three Mark Questions

31. Formation of a Thunderstorm: Thunderstorms develop in hot, humid tropical areas. The strong upward-moving winds (updrafts) carry water vapor into the higher, colder layers of the atmosphere, where it freezes and falls back down. The collision between the swift upward air currents and falling water droplets creates lightning, thunder, and heavy rain.

32. Lightning can occur as opposite charges collide within a cloud, between clouds, or between clouds and the ground. When the build up of charges becomes very large, the insulating property of air breaks down. A sudden flow of charges takes place, producing a bright flash of light called lightning.

33. A cyclone forms through the following steps:

- a. Heat Absorption: Water takes up heat from the atmosphere to change into vapour. When this warm water vapour rises high up into the atmosphere, it cools down.
- b. Condensation and Heat Release: As the water vapour condenses back into liquid water droplets to form clouds, it releases that stored heat back into the surrounding atmosphere.
- c. Pressure Drop & Chain Reaction: This released heat warms the air around the clouds. The warm air rises, causing a significant drop in air pressure. More air rushes toward the center of this low-pressure area. This cycle repeats, creating a massive, swirling system of high-speed winds that forms a cyclone.

34 . Suggest People living in coastal areas should adopt the following safety measures:

- a. Heed Warnings: Do not ignore cyclone warnings broadcasted by the meteorological department through TV, radio, or newspapers.
- b. Emergency Preparedness: Make necessary arrangements to shift essential household goods, domestic animals, and vehicles to safer places or designated cyclone shelters.
- c. Utility Safety: Avoid touching wet electrical switches or fallen power lines, and store enough clean drinking water indoors to prevent water-borne diseases.

35 . Wind currents are driven by temperature differences between land and water:

1. In Summer: The landmass near the equator heats up much faster than the water in the oceans. The air over the land becomes warm and rises, creating a low-pressure area. This causes moisture-laden winds to blow from the oceans toward the land, bringing the summer monsoon rains.
2. In Winter: The process reverses. The land cools down much faster than the ocean water. The air over the ocean is warmer and rises, causing the wind to blow from the cooler land towards the warmer oceans.

36 . When air is heated, it expands and occupies a larger volume. Because the same amount of air now takes up more space, it becomes less dense (lighter) and naturally rises. Conversely, cold air contracts, becomes denser (heavier), and sinks down to take the place of the rising warm air.

## Chapter -7

### Particulate Nature of Matter

#### Answers :

I.

1. A. Physical change
2. D. In solids, particles are closely packed; in liquids, they move past one another.
3. B. Decreases
4. C. Physical state of substances
5. D. Iron piece
6. A. Solid
7. C. Liquids have definite shape and definite size.
8. A. Directly proportional
9. B. Water
10. C. Gas
11. C. Nothing of the chair will remain
12. C. Gas

II.

13. The basic unit that forms a large piece of a substance or material.
14. Space between the particles of matter.
15. There is some space between water particles. The particles of the dissolved substance occupy this space.
16. Liquids do not have a definite shape and take the shape of the container in which they are stored.
17. Inter-particle force of attraction.
18. Solid, liquid, and gas.
19. Solid: Iron piece, stone, ice, wood, etc.  
Liquid: Water, coconut oil, petrol, diesel, kerosene, honey, etc.  
Gas: Air, smoke, oxygen, nitrogen, carbon dioxide, etc.
20. The minimum temperature at which a solid melts and changes into a liquid at atmospheric pressure is called its melting point.
21. The temperature at which a liquid boils and changes into vapour at atmospheric pressure is called its boiling point.

III.

22.

Melting point of water =  $0^{\circ}\text{C}$

Boiling point of water =  $100^{\circ}\text{C}$

23. Take a glass containing water and add a few crystals of potassium permanganate. Initially, pink streaks spread from the crystals. After some time, the entire water becomes uniformly pink. This happens because water particles are in constant motion. They separate the potassium permanganate particles from the crystal and spread them throughout the liquid.

24. Air particles are continuously moving. They collide with fragrance particles and help spread them throughout the room. When an incense stick is lit in one corner of a room, the fragrance is first noticed near it, but after some time it spreads throughout the room and reaches us.

25. Clothes stained with oil can be cleaned using soap. The hydrocarbon end of the soap molecule interacts with dirt, while the ionic end interacts with water. This structure is called a micelle. Washing with water then removes the dirt.

26. Potassium permanganate spreads faster in hot water and very slowly in cold water because water particles move faster in hot water and slower in cold water. Heating increases particle movement.

27. When solids are heated, their particles vibrate more vigorously. As vibrations increase, particles begin to leave their fixed positions. Inter-particle attractive forces weaken, and the solid changes into a liquid.

28. Some substances used in science laboratories may be poisonous, acidic, basic, or harmful. Consuming them may be dangerous.

29. In solids, particles are closely packed and the inter-particle forces of attraction are very strong.

30. Gases do not have a definite shape or size. Gas particles move freely in all directions and inter-particle attraction is negligible.

Solids have a definite shape and size. Their particles are closely packed and strongly attracted to one another. These strong forces hold the particles in fixed positions and prevent free movement.

31. When salt dissolves in water, it breaks into its constituent particles (ions). These particles are extremely small and cannot be seen even with an ordinary microscope. They spread uniformly throughout the water and occupy the spaces between water particles.

32. Yes, air can be compressed. Under normal conditions, there is plenty of space between gas particles. This space can be reduced by applying external pressure.

#### IV.

33.

| Physical Change                       | Chemical Change |
|---------------------------------------|-----------------|
| Crushing a piece of chalk into powder | Rusting of iron |
| Ice melting into water                | Photosynthesis  |
|                                       | Respiration     |
|                                       | Digestion       |

34. The forces that hold the particles of matter together are called inter-particle forces of attraction. Their strength depends on the nature of the substance and the distance between particles.

35.

a.  $0^{\circ}\text{C}$

b.  $133^{\circ}\text{C}$

c.  $1538^{\circ}\text{C}$

36. Take a syringe without a needle.

Pull the plunger fully outward.

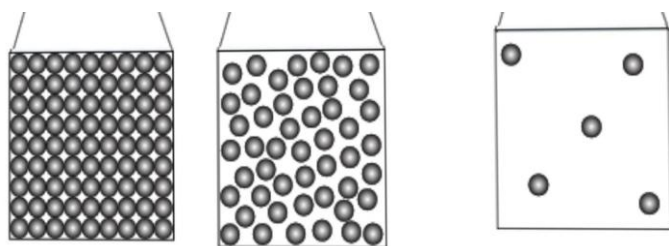
Close the open end with your thumb.

Push the plunger inward slowly and steadily.

The volume of air inside decreases.

This shows that gases have sufficient space between particles, which can be reduced by applying pressure.

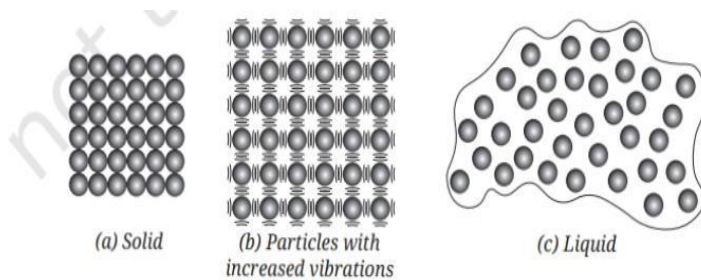
37



Solid.

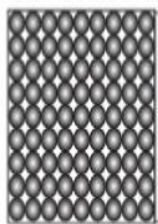
Liquid.

Gas

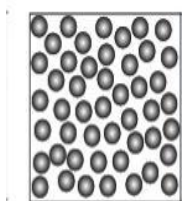


38.

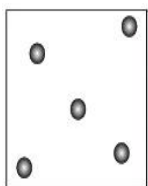
39. (i) Aluminium foil



(ii) Glycerin



(iii) Methane gas

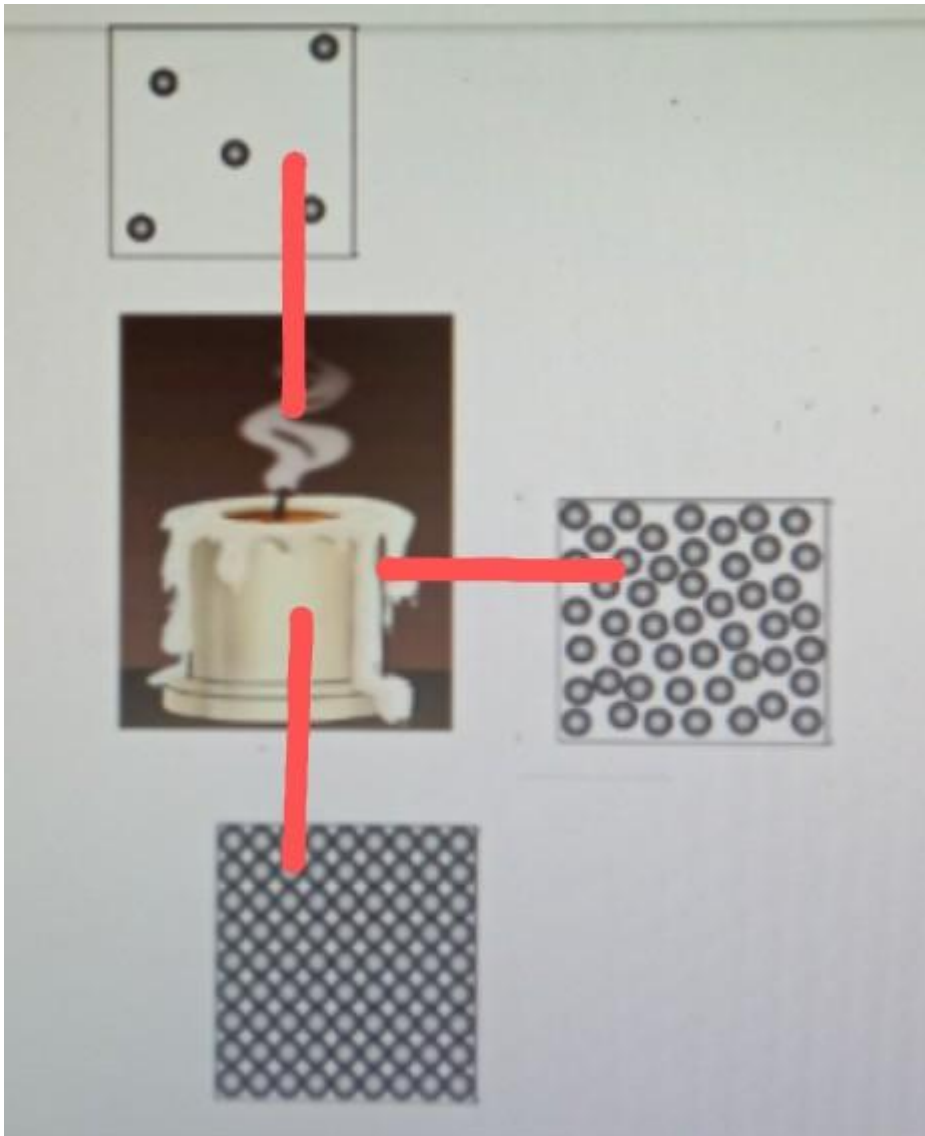


40. A. Solid

B. Liquid

C. Gas

41.



42. When sugar dissolves in water, it breaks into its constituent particles. These particles are extremely small and occupy the spaces available between water particles.

43. LPG exists as a gas in underground petroleum and natural gas reservoirs. During separation and purification, the hydrocarbons are cooled and compressed. When temperature decreases and pressure increases, the kinetic energy of molecules decreases and they come closer together, converting into liquid form. This makes storage and transportation easier.

V.

#### 44. Solids

Have a definite shape and size.

Particles are closely packed.

Inter-particle attraction is very strong.

Inter-particle space is minimum.

Particle movement is negligible; particles only vibrate.

#### 45. Liquids

Have a definite volume but no definite shape; they take the shape of the container.

Particles are less tightly packed than in solids.

Inter-particle attraction is weaker than in solids.

Inter-particle space is greater than in solids.

Particle movement is restricted to a limited region.

#### 46. Gases

Have neither definite shape nor definite volume.

Particles are free.

Inter-particle attraction is minimum.

Inter-particle space is maximum.

Particles move throughout all available space.

VI.

47.

| Solid                            | Liquid                                        | Gas                           |
|----------------------------------|-----------------------------------------------|-------------------------------|
| Particles are closely packed     | Particles are less tightly packed than solids | Particles are free            |
| Strong inter-particle attraction | Weaker attraction than solids                 | Very weak attraction          |
| Minimum inter-particle space     | More space than solids                        | Maximum space                 |
| Particles only vibrate           | Limited movement                              | Move freely in all directions |

48.

Take a syringe without a needle, pull the plunger outward, close the tip with your thumb, and push the plunger inward. The air volume decreases, showing that gases can be compressed because there is space between gas particles.

Repeating the experiment with water (liquid) or sand (solid) shows that they cannot be compressed easily.

49. Milk is a liquid and has no definite shape. Its particles are less tightly packed and can move within a limited space.

A glass tumbler is a solid with definite shape and size. Its particles are tightly packed, the force of attraction is strong, and particle movement is negligible.

50. Water Exists Naturally in All Three States

Solid: Ice

Liquid: Water

Gas: Water vapour

Ice is the solid form of water and changes into liquid water when melted. Liquid water is essential for all living organisms on Earth. Water vapour, the gaseous form, plays an important role in the water cycle.

## CHAPTER 8

### Nature of Matter: Elements, Compounds and Mixtures

#### I.

1. Matter
2. Mixture
3. Lemon juice
4. Mixture
5. Stainless steel
6. Homogeneous mixture
7. Oxygen
8. Oxygen
9. Carbon dioxide
10. Suspension
11. Ice
12. Vapour
13. Silicon
14. Gold
15. 2:1
16. Salt
17. Sodium chloride
18. 1:1
19. Evaporation
20. A and B are elements, C is a compound and has a fixed composition.

#### II.

21. Matter is made up of small particles
22. Each individual substance that makes up a mixture is called its component or constituent
23. Around 78 percent
24. Carbon dioxide
25. Iron, gold, water, sugar
26. Adulteration is the illegal practice of adding inferior or low quality substances to a product
27. Adulteration is done to increase the quantity of a substance or to reduce production costs
28. A pure substance is a single type of matter that contains identical particles throughout
29. Hydrogen
30. Oxygen
31. Hydrogen and oxygen
32.  $\text{Hydrogen} + \text{Oxygen} \rightarrow \text{Water}$
33. Substances that cannot be broken down into simpler substances and are made of only one type of particle are called elements
34. Elements are made of atoms
35. Stainless steel
36. Sodium and chlorine
37. Alloys are stronger and harder than pure metals. They can easily prevent rusting.
38. Naturally occurring solid substances found on Earth that possess a definite chemical composition are called minerals.

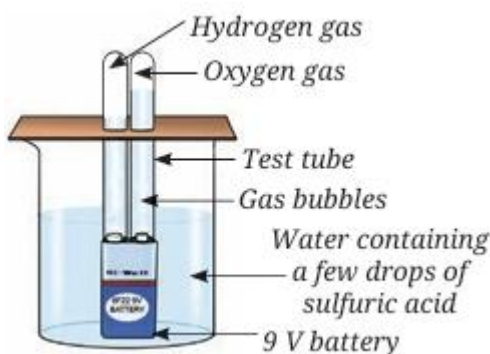
39. Quartz, calcite, mica, pyroxene, olivine are examples of minerals  
 40. They possess mass and occupy space.

### III

41. In a mixture, the proportion of components is not fixed.  
 Components retain their individual properties.  
 They can be separated by simple physical methods.
42. Homogeneous mixture: Components are completely and uniformly mixed throughout.  
 Examples: Sugar solution, salt water.
- Heterogeneous mixture: Components remain visibly separate and are not uniformly distributed.  
 Examples: Sand and water mixture, oil and water.
43. A homogeneous mixture of two or more metals, or a metal and a non-metal, is called an alloy.  
 Examples: Brass, bronze, stainless steel.
44. Nitrogen 78%, Oxygen 21%, Argon, Carbon dioxide, Water vapour and dust particles.
45. The proportion of gases in the air can vary slightly from place to place.
46. Oxygen in the air retains its individual property of supporting combustion.
47. Components of air can be separated by physical methods.
48. Quicklime (Calcium oxide) + Water → Slaked lime (Calcium hydroxide) + Heat
49. Homogeneous mixtures: Vinegar, soda water, sea water, alloy, baking powder.  
 Heterogeneous mixtures: Oil and water, sand and water.

### IV

48. Food adulteration degrades the quality of a product. It also makes the product harmful to health.



- 49.
50. When a burning candle is brought near the test tube, the test tube containing hydrogen burns with a pop sound. In the test tube containing oxygen, the candle burns more brightly.
51. Metals. Examples: Iron, gold.  
 Non-metals. Examples: Oxygen, sulphur.  
 Metalloids. Examples: Silicon, boron.
52. Elements that exhibit the properties of both metals and non-metals are called metalloids.  
 Examples: Silicon, germanium.
53. A new substance formed when two or more elements chemically combine in a fixed ratio by mass is called a compound. Examples: Water  $H_2O$ , Sodium chloride  $NaCl$ .
54. Sugar turns into a black mass.  
 Water droplets appear on the walls of the test tube.

55. When iron and sulphur powder are mixed, a heterogeneous mixture is formed. Its components retain their original properties and their black and yellow colored particles can be seen.

56. Gas A: Hydrogen gas.

Word equation: Iron + Dilute hydrochloric acid  $\rightarrow$  Iron chloride + Hydrogen gas

## V

57. Hydrogen is a highly combustible gas and oxygen helps in combustion. However, water formed by their chemical combination is used to extinguish fire. Thus, the properties of a compound are entirely different from its constituent elements.

58. Water H<sub>2</sub>O: Essential for drinking and agriculture.

Carbon dioxide CO<sub>2</sub>: Used by plants for photosynthesis and in fire extinguishers.

59. Yes. Gold can be called a mineral because it occurs naturally in the Earth's crust and has a specific crystalline structure. Similarly, it can be classified as a metal because it possesses lustre, ductility, malleability, and electrical conductivity.

## IV.

60. When lime water is continuously shaken, calcium hydroxide reacts with carbon dioxide to form calcium carbonate and water, turning the lime water milky. This shows the presence of carbon dioxide in the air when it is exposed.

61.

| Sl.No. | Mixture-type      | Examples                                                | Uniform or non-uniform |
|--------|-------------------|---------------------------------------------------------|------------------------|
| 1.     | Gas and gas       | Air                                                     | Uniform                |
| 2.     | Gas and liquid    | Aerated water (soda water)<br>Oxygen dissolved in water | Uniform<br>Uniform     |
| 3.     | Solid and gas     | Carbon particles in air                                 | Non-uniform            |
| 4.     | Liquid and liquid | Acetic acid in water (vinegar)<br>Oil and water         | Uniform<br>Non-uniform |
| 5.     | Solid and liquid  | Sand and water<br>Seawater                              | Non-uniform<br>Uniform |
| 6.     | Solid and solid   | Baking powder (baking soda and tartaric acid)<br>Alloys | Non-uniform<br>Uniform |

62. Pure substances: Baking soda, sugar.

Mixtures: Milk, potato fruit juice, soil.

63. Metals: Gold, silver, magnesium, iron.  
Non-metals: Carbon, sulphur, hydrogen, oxygen.  
Metalloids: Silicon, boron.
64. Chemical compound: Sugar.  
Detection method: When sugar is heated, it melts and turns black while water escapes as steam.  
This is a chemical change, proving that sugar is made up of carbon, hydrogen, and oxygen components in a fixed ratio.
65. Correct matching: 3) Pure substances - Carbon dioxide, iron, oxygen, sugar. Reason: All of these have a specific chemical composition and uniform properties throughout.
66. Elements: Iron, magnesium, oxygen.  
Compounds: Iron oxide, magnesium oxide.  
Mixture: Moist air.
67. No, it is not possible to call it pure.  
Reason: According to science, milk is a mixture. It contains different substances with varying chemical properties like water, fat, and proteins.
68. Expiry Date / Best Before. FSSAI logo and information regarding the ingredients listed on it.
69. This degrades the quality of the product. It also makes the product hazardous to health.
70. In urban areas with high numbers of cars and vehicles, smoke and carbon dioxide levels are high.  
Conversely, in dense forest areas, the level of oxygen is higher due to more plants, making the air pure.
71. It is an element.  
Reason: By definition, an element is a substance that cannot be split down into simpler substances by any simple physical or chemical reactions.
72. Gold is an element and it is made up of only one type of atom. No matter how small you cut the gold, its basic properties like color and luster remain unchanged.
73. Water is a compound made of two different elements, hydrogen and oxygen, combined in a fixed ratio. Water can be split back into hydrogen and oxygen through a chemical reaction.
74. This supports the Law of Constant Proportions in chemical combinations. This means that in any compound, elements are always present in a definite proportion by mass.
75. These are the main ores of iron, from which the iron and steel needed for the modern world are obtained. Building construction: Large buildings cannot be constructed without using them because iron is absolutely necessary for structural safety.
76. No, it is not possible to call it a mineral. According to the basic definition, minerals must occur naturally in the Earth. Since synthetic diamonds are man-made in a laboratory, they are not called minerals.
77. Minerals like silicon, copper, and lithium are absolutely essential for making mobile and laptop processors, batteries, and circuits. Consequence: If minerals run out, technological advancement will stop, production of electrical appliances and vehicles will cease, and modern lifestyle will completely collapse.

## V

78. Elements: Aluminium, gold, oxygen, nitrogen, sulphur, hydrogen.  
Compounds: Carbon dioxide, magnesium oxide, rust, iron sulphide, glucose, sodium chloride, baking soda.

Mixtures: Sand, sea water, muddy water, soda water, fruit juice.

79. No, it is not possible. Reason: An element is a simple substance made up of only one kind of atom and cannot be broken down. A compound is a new substance formed by the chemical combination of two or more elements. Since these two concepts are completely different, one substance cannot be called both.

80. Water would not exist in a liquid state; it would float in the air as a mixture of hydrogen and oxygen gases. We would not get drinking water and the origin and survival of life on Earth would be impossible. Since hydrogen is a highly combustible gas, a small spark would explode the entire atmosphere.

81. Quicklime Calcium oxide reacts vigorously with water to form slaked lime Calcium hydroxide and a large amount of heat is released during this reaction.

Word equation: Quicklime + Water  $\rightarrow$  Slaked lime + Heat

Chemical equation:  $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{CaOH}_2 + \text{Heat}$

82. When carbon dioxide is passed through lime water, water-insoluble calcium carbonate is formed as a white precipitate, turning the water milky white.

Word equation: (Calcium hydroxide) lime water + Carbon dioxide  $\rightarrow$  Calcium carbonate + Water

83. When an electric current is passed through water, it decomposes into its component gases, hydrogen and oxygen, which is called electrolysis. Hydrogen gas is released at the cathode and oxygen gas is released at the anode. The volume of hydrogen gas released is twice that of oxygen gas in a 2:1 ratio.

84. New useful compounds and medicines for diseases can be manufactured. Hard and rust-free alloys required for industries can be developed.

## V.

85.

1. When a magnet is brought near sample A, the iron particles are attracted to the magnet because it is a simple physical mixture. Sample B is not attracted because it has undergone a chemical reaction to form a new compound, iron sulphide.

2. When acid is added to sample A, hydrogen gas is released, which burns with a pop sound. When acid is added to sample B, hydrogen sulphide gas with a rotten egg smell is released.

3. Conclusion: In a mixture, components retain their individual properties, but in a compound, the original properties of the components are entirely destroyed and a new substance with new properties is formed.

86.

- 1) Sugar contains carbon, hydrogen, and oxygen. When heated, they combine chemically to escape as water vapor, leaving droplets on the cooler walls of the test tube.
- 2) The black chemical substance left behind is carbon charcoal. Its properties are that it is black, odorless, and insoluble in water.
- 3)Precautionary measures: The mouth of the test tube should not be pointed towards oneself or others. A test tube holder must be compulsorily used to hold the test tube.

## CHAPTER- 9

### THE AMAZING WORLD OF SOLUTES ,SOLVENTS,AND SOUTIONS

#### Answers

#### I.

- 1) A) Liquid
- 2) D) Nitrogen
- 3) C) Kheer
- 4) B) When temperature increased
- 5) A) 20° C
- 6) D) Physical Change
- 7) C) Growth of aquatic plants and fish
- 8) B) increases
- 9) D) homogeneous mixture
- 10) D) Water
- 11) B) Saturated Solution
- 12) B) Temperature when increased
- 13) C) Carbon di oxide
- 14) C) Mass
- 15) A) Density = Mass / Size
- 16) A) Shape
- 17) B) 1000g/m<sup>3</sup>
- 18) C) Mass
- 19) A) Cubic meter
- 20) B) Density Increases
- 21) A) Decreases
- 22) C) Gas
- 23) C) Expansion.

## II .

24) Homogeneous mixture of such as that of salt or sugar, and water, is called a solution.

25) Whenever a solid is mixed with a liquid to form a solution, the solid component is called the solute, and the liquid component is called the solvent.

Ex : Solute =sugar      Solvent = Water

26) Solute : Sugar and tea powder ,      Solvent : Milk ,

27) Solute : Oxygen , Carbon Dioxide .      Solvent : Nitrogen .

28) The amount of solute present in a fixed quantity of solution (or solvent) is termed as its concentration.

29) 1500 ml as much as water hold

30) Saturated Solution.

31) Liquid.

33) Heterogenous Mixture.

34) Cotton < Wooden Piece < Castor oil < Iron Piece .

35) Milileter (ml) which is equivalent to 1 Cm<sup>3</sup>

36) Measuring cylinder, Burette , Beaker.

37) Volume = l x w x h (l=length, w= Width, h= hight )

38) Density = Mass / volume

39) Four Degree Celsius (4<sup>0</sup> C )

40) Gram or Kilogram .

## III.

41) The solution in which more solute can be dissolved at a given temperature is called an unsaturated solution . However when the solute stops dissolving and begins to settle at the bottom the solution is called a saturated solution at that particular temperature .

42) Solute - Tea powder and sugar,      Solvent - water and milk,      Solution - tea

43) Maximum amount of substance ( solute ) that can completely dissolve in a specific amount of solvent at a particular temperature.

Example : Sugar Recipe

44) Four teaspoons of salt in 50 ml of water is more concentrated.

45) The density of ice is less than that of water.

46) Wooden stick is float, and Iron rod is sinks , Because of density of wooden stick is less than that of water and iron rod density is more than that of water.

47) Volume = l x w x h  
 $25\text{cm} \times 18\text{cm} \times 2\text{cm} = 900\text{ cm}^3$

48) Liquid = 16.400 g  
Mass = 5  $\text{cm}^3$   
Density = Mass / Volume  
Density = 16.400 g / 5  $\text{cm}^3$   
Density = 3.28  $\text{g/cm}^3$

Answer : Density of the transparent stone is 3.28  $\text{g/cm}^3$

49) Solid particles are tightly packed and by the giving of heat causes these particles to vibrate, liquid particles move fast and expand and gas particles are move rapidly in all directions.

50) The hot air inside the balloon is less dense and lighter than the cool air and air is denser at outside, it which pushes the balloon upward.

#### IV .

51) Water is densest at 4°C as surface water cools and freezes, that ice floats and acts like a lid. below that water is not freeze so aquatic organisms survive in water

52 ) The maximum amount of solute that dissolves in a fixed quantity of the solvent is called its solubility.

53) Formula : Volume = Mass / Density  
Density = 7.9  $\text{g/cm}^3$

Mass = 600 g

Volume =  $600 / 7.9 = 75.95\text{ cm}^3 \approx 76\text{ cm}^3$

54) The amount of solute present in a fixed quantity of solution (or solvent) is termed as its concentration (more amount of solute). Depending upon the amount of solute present in a fixed quantity of solution, it can be called a dilute solution (less amount of solute) .

Ex : Concentration solution : Honey, Dilute solution : Lemon juice

55 Take about 50 ml of water in a glass beaker and measure its temperature using a laboratory thermometer, say 20 °C., add a spoonful of baking soda (sodium hydrogen carbonate) to the water and stir until it dissolves. Continue adding small amounts of baking soda while stirring till some solid baking soda is left undissolved at the bottom of the beaker, Now heat the contents to 50°C while stirring , You will observe that it has dissolved. Continue adding more baking soda while stirring at this temperature until some solid baking soda remains undissolved. Again, heat the contents further to 70°C while continuing to stir. The undissolved baking soda dissolves. It has been found that for most of the substances, the solubility increases with an increase in temperature. We can also say that a saturated solution at a particular temperature behaves as an unsaturated solution if the temperature is increased.

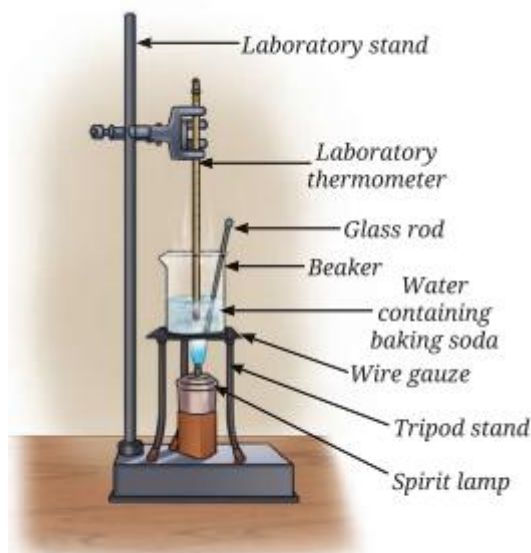


Fig. 9.7: Dissolution of baking soda in water

56)

Formula :

$$\text{Density} = \text{mass} / \text{volume}$$

$$\text{Mass} = 25 \text{ g}$$

$$\text{Volume} = 90 \text{ cm}^3$$

$$\text{Density} = 25 \text{ g} / 90 \text{ cm}^3 = 0.278 \text{ g/cm}^3$$

Water density =  $1 \text{ g/cm}^3$ .

This Stone sculpture density is  $0.278 \text{ g/cm}^3$ , which means about 4 times less than water, so sculpture floats on water.

57) Water is denser than oil so gravity pulls it down harder that pushes the lighter oil upward to the top. if you mixed them the water settles at bottom and oil floats on top.

**V.**

58) An unpeeled orange floats, because its porous, The rind traps tiny air pockets, making the overall orange less dense than water. When peeled those air pockets are lost, making the dense fruit heavier than the water it displaces so it sinks.

59 ) Substance A

$$\text{Density} = \text{mass} / \text{volume}$$

$$\text{Mass} = 200 \text{ g}$$

$$\text{Volume} = 40 \text{ cm}^3$$

$$\text{Density} = 200 / 40 = 5 \text{ g/cm}^3$$

Substance B .

$$\text{Mass} = 240 \text{ g}$$

$$\text{Volume} = 60 \text{ cm}^3$$

$$\text{Density} = 240 / 60 = 4 \text{ g/cm}^3$$

So substance A is heavier than substance B.

Definition :

Density is how much mass is packed into a given space.

In object A 5 grams per  $1 \text{ cm}^3$  . In the object B only There is 4 grams per  $1 \text{ cm}^3$ .

60) Even if it changes modelling Clay shape there will be no change in density.

Description : When changed object shape its mass (120g) and Size ( $60 \text{ cm}^3$ ) unchanged, as well the density remains same, mass of clay 120 g remains the same because there is no adding or removing any clay.

61) Collect various objects from your surroundings, such as a stone, metal keys, and so on. Fill a measuring cylinder with water up to any desired volume, say 50 ml and record the initial volume taken, Tie the object, say a stone, with a thread and slowly lower it into the measuring cylinder. Record the final volume after the level rises, say 55 ml, as shown in Fig. 9.19b. Subtract the initial volume from the final volume after the object is put into the measuring cylinder. This is the volume of the object.

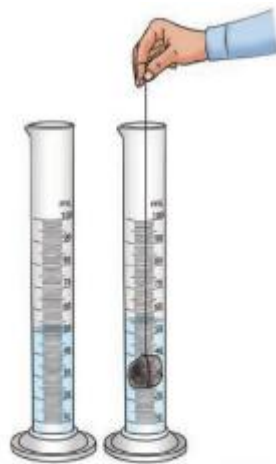


Fig. 9.19: Level of water in the measuring cylinder (a) Without object; (b) With object

62)

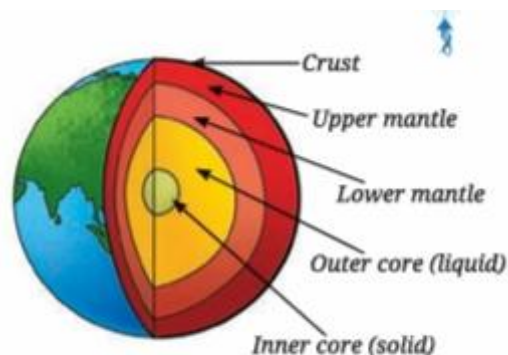


Fig. 9.20: Layers of Earth

Crust < Upper mantle < Lower core < Outer core < Inner cor

## Chapter : 10

### Light , mirrors and lenses

#### Answers

- 1) B. Mirror
- 2) C. Reflects
- 3) A. A new steel spoon
- 4) C. Convex mirror and concave mirror
- 5) D. Small in size and inverted
- 6) D. has an outwardly curved surface
- 7) A. Aluminum
- 8) C. Both statement 1 and 2 are correct .
- 9) B. Concave mirror
- 10) B. Concave mirror
- 11) A. Convex mirror
- 12) D. Provides a wider field of vision
- 13) A. Concave mirror and convex lens
- 14) C. Both the angle of incidence and the angle of reflection are equal.
- 15) D. Plane mirror , concave mirror , convex mirror
- 16) A. Law of reflection
- 17) D. In this case, light does not reflect .
- 18) A. Convergent
- 19) C. Convex mirror
- 20) D. inward curve in the middle and bulging at the edges
- 21) B. Concave mirror
- 22) D. Curved surface of a water drop
- 23) A. Concave lens
- 24) B. Convex lens
- 25) D. The object will appear erect and large in size
- 26) A. Inverted

27) C. X Parallel Y Convergent Z Divergent

28) D. Convex lens

29) A. Both proposition and reason Correct and the reason is the correct explanation for the proposition.

## II.

30) The device that reflects light to form an image is called mirror.

31) Plane mirror and Spherical mirror .

32) A mirror made from reflecting surface of a sphere is called a spherical mirror.

33) Convex mirror , concave mirror

34) Convex mirror .



35) Concave mirror .



36) In a convex mirror, when an object is close, the image formed is always smaller in size and erect. Based on this, Rekha identifies the convex mirror

37) Concave mirror used.

38) 1. The size of the image is equal to the size of the object.

2. The image is formed at the same distance behind the mirror as the object is in front of it.

39) The mirror which converge the light rays is called concave mirror

40) Convex mirror is used as a surveillance mirror in shops.

41) Convex lens

42) The lens in our eye is a convex lens.

### III

43) The ray of light that falls on the mirror is the incident ray, and the ray of light that returns (bounces back) from the mirror is the reflected ray..

44) The light rays reflected from a concave mirror meet at a single point; therefore, a concave mirror is called a converging mirror.

45) Devices that use mirrors and lenses to focus sunlight onto a small area are called solar concentrators.

46) A lens that is thin in the middle and thick at the edges is called a concave lens.

47) They are erect and smaller in size.

48) First law of reflection: When light falls on a mirror, the angle of incidence is equal to the angle of reflection.

Second law: The incident ray, the reflected ray, and the normal all lie on the same plane..

49) In the picture As shown One Thin Sheet of paper And One Take off your mirror . Take off your mirror . The reflecting surface Towards the sun As if facing That Hold on . From the mirror . Reflected Sun Light Paper Sheet Above Make it fall . Sharp And Bright Point of light Until dawn Paper Distance Set Mirror And Paper Sheet Some Minutes Time Unshakably Hold steady . The paper To burn with smoke Begins . Conclusion From your mirror Reflected light One At the point Focus Sharp Light Ha Goo Heat Also Produces

50) Lenses are used in the glasses we wear , cameras , telescopes, and microscopes .

51) Because the convex lens in the eye has the ability to change its shape .

52) 1. Convex Mirror 2. Plane mirror 3. Concave Mirror

53)

| Convex mirror                                                                         | Concave mirror                                                                                                                                              |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Convex mirror is divergent the light rays                                          | 1. Concave mirror is Convergent the light rays .                                                                                                            |
| 2. The image formed in a convex mirror is always smaller than the size of the object. | 2. The image formed in a concave mirror is larger than the size of the object. As the distance changes, the size of the image becomes smaller and inverted. |

54) Convex and concave mirrors are made by grinding and polishing a flat piece of glass to transform it into a curved surface. If a reflective coating is applied to the outer curved

surface, it becomes a concave mirror; if it is applied to the inner curved surface, it becomes a convex mirror.

55 ) Concave mirror is used:

1. In headlights of vehicles
2. In barber shops (shaving mirrors)
3. As reflectors in torches

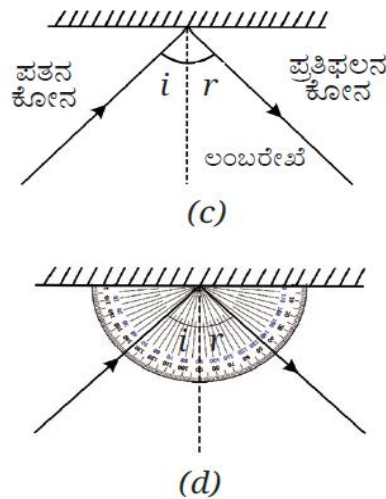
56) In figure (1), when a toy is placed close to the mirrors, a magnified image is formed in the concave mirror, and a smaller image is formed in the convex mirror.

In figure (2), the toy is moved away from the mirrors. Here, the image in the concave mirror is inverted, and in the convex mirror, it is erect.

57) Place a handful of dry grass on the ground and hold a convex lens facing the sun so that the bright sunlight falls on the grass. Adjust the distance of the convex lens until a bright and sharp point of light appears, and hold it steadily without shaking for a few minutes. After some time, the grass starts to smoke and catches fire. The light coming from the lens concentrates at a single point, generating enough heat to burn the grass.

### III

58)

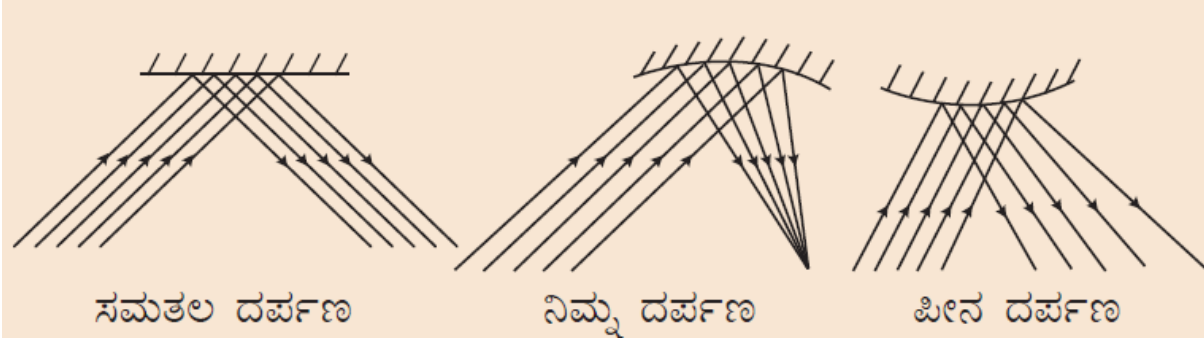


First Law of Reflection : When light falls on a mirror, the angle of incidence is equal to the angle of reflection.

Second Law : The incident ray, the reflected ray, and the normal all lie on the same plane.

59) As shown in the figure, take a thin sheet of paper and a concave mirror. Hold the concave mirror such that its reflecting surface faces towards the sun. Direct the sunlight reflected from the mirror onto the sheet of paper. Adjust the distance of the paper until a sharp and bright point of light appears, and hold both the mirror and the paper steadily without shaking for a few minutes. The paper will start emitting smoke and begin to burn starts. Therefore, the light reflected from mirror concentrates at a point, producing intense light and heat as well.

60) Yes, just like a plane mirror, concave and convex mirrors also obey the laws of reflection.



61) Mirrors and lenses play a significant role in utilizing solar energy efficiently and effectively. In solar furnaces, concave mirrors can be used to focus light and generate heat from it, which can then be utilized in manufacturing units. By using solar cells, electricity can be produced on a large scale; for this purpose, solar panels are installed in vast open areas. This helps in overcoming the shortage of electricity. By using solar water heaters, which we see on the rooftops of our houses, water can be heated, thereby reducing the use of conventional fuels like kerosene, firewood, electricity, etc., and minimizing environmental pollution. By cooking in solar cookers, fuel economy can be achieved.

62) As shown in the figure, arrange a supported plane mirror, a torch, a comb, a paper clip to hold the comb upright, a sheet of white paper, and a strip of black paper on a table. Except for one slit of the comb, cover the remaining parts with the black paper and pass the torch light through this slit of the comb. Observe the incident ray and the reflected ray. Draw a normal line with the help of a pencil at the point where the two rays meet, draw the incident ray, reflected ray, and the normal. Note that all these three lie on the same plane make the light ray fall on the mirror at different angles and observe how the direction of the reflected ray changes. The angle of incidence is equal to the angle of reflection from the normal line, measure and verify this using a protractor

## CHAPTER.11

### Keeping time with the skies

#### I. Multiple Choice Questions

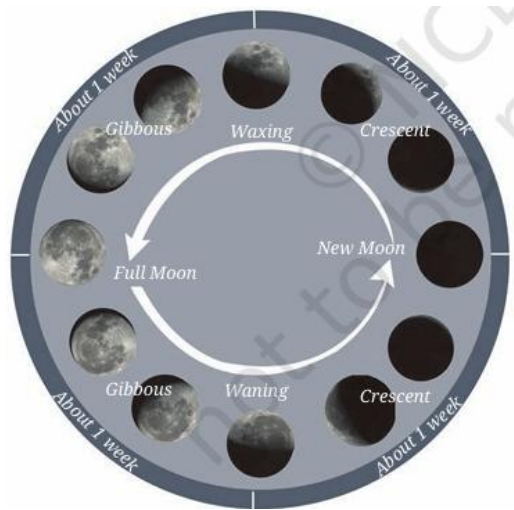
1. B) Full Moon Day (Hunnime)
2. C) The change in the part of the Moon reflecting sunlight
3. C) Waning period
4. A) Amavasya (New Moon)
5. B) Waxing period
6. B) Krishna Paksha
7. A) Shukla Paksha
8. B) A month
9. B) Poornima (Full Moon)
10. B) The Moon reflects the light of the Sun
11. D) 50min
12. C) 29.5 days
13. B) Cycle of the Moon's phases
14. C) 365
15. B) Solar calendar
16. B) Shalivahana Shaka
17. C) Chaitra
18. C) Luni-solar calendar
19. B) Adhika Masa (Extra/Intercalary month)
20. C) New Moon day of Kartika month
21. B) Moon
22. B) That part of the Moon never turns toward the Earth.
23. B) Sunlight falls on the far side (hidden face) of the Moon.
24. B) 500 km
25. B) 100 minutes
26. B) Preventing earthquakes
27. C) Indian Space Research Organisation.

#### II. One-Mark Questions

28. Dr. Vikram Sarabhai is recognized as the Father of the Indian Space Programme.
29. The Vikram Sarabhai Space Centre is located in Thiruvananthapuram, Kerala.
30. The Moon appears bright because its surface reflects sunlight toward the Earth.
31. The regular nightly change in the visible appearance of the Moon is called the "Phases of the Moon".
32. We always see only one side because the Moon's axial rotation period perfectly equals its orbital revolution period around Earth.
33. The phases of the Moon are the changing variations of its sunlit portion as observed from our viewpoint on Earth.
34. No, if its rotation stopped completely, its entire spherical surface would be revealed to Earth during one monthly orbit.
35. A solar day is the complete time duration taken by the Earth to rotate once fully on its axis relative to the Sun.
36. The average duration of a standard solar day is exactly 24 hours.

37. The annual cycle of seasons and the monthly lunar cycle are prominent natural cycles longer than a single day.
38. The Earth takes approximately 365 days, 5 hours, 48 minutes, and 46 seconds to revolve completely around the Sun.
39. According to a standard lunar calendar, there are exactly 12 months in a single year.
40. February contains exactly 29 days during a leap year.
41. A Luni-solar calendar is structured on lunar cycles for months while applying corrections to stay aligned with solar seasons.
42. The Government of India formally adopted the National Calendar on March 22, 1957.
43. In a normal year, the month of Chaitra begins exactly on March 22 of the Gregorian calendar.
44. In a leap year, the month of Chaitra begins on March 21 of the Gregorian calendar.
45. The start date of the National Indian New Year moves exactly one day earlier to March 21.
46. They shift because Indian festivals follow a Luni-solar calendar system, which runs roughly 11 days shorter than a pure solar year.
47. Ramzan
48. Two key functions of artificial satellites are weather monitoring and broadcasting communication signals.

### III: Two-Mark Questions



- 49.
50. After the New Moon, as the Moon moves away from the Sun, the illuminated part visible to the Earth increases and becomes a Full Moon.
51. After 15 days. It takes 29.5 days for a complete lunar cycle, and half of that period is required to go from Full Moon to New Moon.
52. Because the Moon's rotation speed on its axis and its revolution speed around the Earth are equal.
53. Due to the grip of Earth's gravitational force.
54. Earth's rotation defines a day; Moon's revolution around the Earth defines a month.

55. Because a Lunar year has 11 days less than a Solar year.
56. Since agriculture depends on weather seasons, the Solar calendar accurately reflects seasonal changes.
57. By adding an extra month (Adhika MasA) once every three years.
58. It synchronizes the lunar phases with solar seasons, giving accurate information for festivals and agriculture.
59. Chaitra, Vaishakha, Jyeshtha, Ashadha, Shravana, Bhadrapada
60. Similarity: Both have 12 months and 365 days. Difference: The National Calendar starts with Chaitra and follows the Shalivahana Shaka; the Gregorian Calendar starts with January and follows the Christian Era.
61. Lunar calendar is based on the Moon's motion (354 days); Solar calendar is based on the Sun's motion (365 days).
62. Man-made satellites. They are bound by Earth's gravity and revolve around the Earth in regular orbits.
63. Natural satellite is nature-given (Moon); Artificial satellite is a man-made machine (INSAT).

#### **IV. Three mark questions**

64. The Moon provides light at night by reflecting the sunlight that falls on it towards the Earth.
65. The cycle of lunar phases would stop completely.
66. Based on the background of stars, its daily rising time, and its angle in the sky.
67. Because the position of the Moon relative to the Earth and the Sun changes daily, changing the illuminated part visible to us.
68. As the angle between the Sun, Earth, and Moon changes, the illuminated portion visible from Earth changes.
69. If the Moon stopped rotating on its axis, we would see all sides of the Moon (including the current hidden backside) gradually over the period of a month from Earth.
70. No, the entire surface of the Moon is not dark on a New Moon day. At that time, the other half (the side not visible to Earth) is completely illuminated by sunlight.
71. Small variations in Earth's rotation period; this has no effect on the average 24-hour day length over a long period.
72. By observing the daily change in the Moon's shape and the 30-day cycle from New Moon to Full Moon.
73. By dividing the Earth's revolution period around the Sun (365.25 days) into 12 parts, months were configured with 30 or 31 days.
74. Luni-Solar calendar depends on both the Moon and the Sun and has an extra month; Solar calendar depends only on the Sun's motion.
75. Based on the Shalivahana Shaka, contains 12 months, normal year has 365 days, leap year starts on March 21 instead of March 22.
76. By continuously tracking the position, movement, and intensity of storm clouds and transmitting images.
77. By providing early warnings about storms, heavy rains, and severe weather situations.
78. Television broadcasts can be received seamlessly. Solar eclipses do not interrupt television broadcasts.
79. After about 120 to 130 years. It changes because an extra 6 hours accumulates every year.

80. Full Moon phase. On a Full Moon day, the Moon rises exactly at sunset, stays in the sky all night, and sets at sunrise.

## V.Four mark questions

81

- 1) Yes, the shape changes daily.
  - 2) No, it is not visible on a New Moon day.
  - 3) No, it rises about 50 minutes later every day and changes its position.
82. Because the Moon revolves around the Earth, it moves about 12 degrees eastwards in the sky daily, so it rises roughly 50 minutes later each day.
83. When the Moon is close to the Sun, the sunlight falls on the side facing away from Earth, so the illuminated portion facing us becomes smaller.
84. Paint one half of a black ball white, rotate it around a light source at different angles, and observe the changing shapes of the white portion.
85. By calculating the sunrise and sunset times for various days of the year and taking the average total days, the average length of a day is proven to be 24 hours.
86. To balance the extra quarter-day of Earth's true orbital period, 1 day is added to February once every 4 years, making it a 366-day year called a leap year. This prevents the calendar and natural seasons from drifting. Rule: Normal years must be divisible by 4, and century years (e.g., 2000) must be divisible by 400 to be a leap year.
87. This calendar matches both lunar phases and solar seasons using mathematical formulas, making it highly scientific.
88. It is formulated based on the precise motion of the Sun, Equinoxes, Solstices, and Earth's exact revolution.
89. Months of National Calendar and their number of days:  
*Chaitra* (30/31 days), *Vaishakha* to *Bhadrapada* (31 days), *Ashvina* to *Phalguna* (30 days). (p. 5)  
90Ugadi - Chaitra Shukla Pratipada, Deepavali - Karthika Amavasya, Mahanavami - Ashvina Shukla Navami.
91. Artificial satellites receive signals from stadium transmitters and relay them back instantly to ground control centers, enabling live telecasts.
92. Mobile communication, Internet, GPS navigation, banking systems, and weather forecasting would come to a complete standstill.
93. No. Because there is a difference between the Gregorian year and the Moon's orbital cycle, the Full Moon does not fall on May 6 every year.
94. Since a solar year has 12 months, a 3-year period contains 36 months. However, 37 full moons occur in this timeframe. If we distribute one full moon per month, 36 full moons are accounted for across 36 months, leaving 1 extra full moon. This remaining full moon must be placed in a month that already has one, proving that at least one calendar month must have two full moons.
95. The duration of the lunar month would increase, expanding the gap with the solar year and requiring an extra month (Adhika Masa) to be added more frequently.
96. 1. Diagram showing a half-moon during the waxing phase.



- 2.The Moon is in the waxing phase (Shukla Paksha Half-Moon).

## **VI.Five mark questions**

98.

- 1) True: Only the reflected part of the Moon is visible from Earth.
- 2) False: Lunar phases are caused by the Moon's changing position relative to Earth's view, not by Earth's shadow (which causes eclipses).
- 3) True: Calendars are based on cyclical planetary/celestial movements.
- 4) False: The Moon can be seen in the sky during the daytime in several of its phases.

99. 1)

Three days after New Moon: F

Full Moon: E

Three days after Full Moon: A

One week after Full Moon: C

Day of New Moon: B

- 2) The backside of the Moon is never visible from Earth.

**CHAPTER 12**  
**UNIT HOW NATURE WORKS WITH HARMONY**  
**KEY ANSWERS**

**I.**

- 1.D. West Bengal
- 2.A. Changes in rainfall and temperature
- 3.B. Route path
- 4.C. Forest
- 5.C. Fish
- 6.C. Petals
- 7.A. Flies
- 8.B. Shelter
- 9.D. Forest
- 10.A. Sunlight
- 11.A. Demoiselle Stork
- 12.A. Bacteria
- 13.A. Bullfrog
- 14.B. Asir Jawahar Thomas John Singh
- 15.A. Sundarbans

**II. One Mark Questi**

16. Due to scarce of vegetation and waterholes dry up in their natural habitat, elephants may venture into nearby fields or gardens in search of food such as bananas and sugarcane.

17. Advantages of transport routes-:

They provide routes for wildlife such as elephants and allow them to travel between vast areas of forest when needed, avoiding conflict with human settlements.

18. The components of our environment are biotic and abiotic components.

19. Our ecosystem has a variety of habitats, different plants and animal species. This is called biodiversity.

20. The place where an organism lives is called its habitat.

21. The classifications of organisms found in a habitat are

- a. Plants
- b. Animals
- c. Microorganisms

22. A group of organisms of the same type living together in a habitat is called a community.

23. The process of transferring pollen from the stamens to the pistils of the same flower or different flowers is called "pollination".

24. Plants and animals depend on each other for nutrition, respiration and reproduction.

25. Types of ecosystems found in nature

a. Aquatic ecosystem

b. Terrestrial ecosystem

III.

26. Living organisms found in a forest habitat:-

plants, grass, trees, birds, animals, aquatic animals and microorganisms.

Non-living things:- soil, minerals, rocks, water etc.

27. Fish get food, water and oxygen from lakes.

28. Factors that cause competition among organisms of the same type are food, water, air, space or shelter for growth.

29. Plants, animals and microorganisms are found in a habitat community.

30. The process by which plants make their own food is called photosynthesis. The materials required for the process of photosynthesis are sunlight, water and carbon dioxide.

31. Herbivores:- organisms that eat only plants are called herbivores. For example:- deer, rabbit etc.

Carnivores:- organisms that eat only animals are called carnivores. For example:- leopard, tiger.

32. Organisms that eat both plants and animals are called omnivores. For example, crows, foxes and rats.

33. Grass ---→ grasshopper ---→ frog ---→ snake.

34. Each organism has a specific position in the food chain, which is called a trophic level. Green plants are at the first trophic level.

35. In an ecosystem, different food chains are interconnected and form a complex system. This is called a food web.

36. The process of breaking down complex substances in dead plants and animals into simple substances and returning important nutrients to the soil is called decomposition. Fungi and bacteria are examples of decomposers.

37. Effects of excessive use of pesticides

1. Many plants in the water body start dying due to pollution.
2. The decrease in the number of plants leads to a decrease in the fish population in that water bodies.
3. Pesticides run off through rainwater and enter the water bodies, destroying the aquatic organisms there.
4. The destruction of aquatic organisms causes an imbalance in the aquatic ecosystem.

38. In an ecosystem, organisms usually compete for resources such as food, water, space or sunlight. This competition helps to control the size of the population and keeps the ecosystem in balance, otherwise the number of one species will be too high, which will cause an imbalance in the ecosystem.

39. Symbiosis:- In this system, one organism benefited but the other organism is not harmed, for example, orchids growing on trees.

Parasitism:- In this system, one organism benefits but the other organism is harmed.

For example:- the fur on a dog's body.

IV.

40. Aquatic organisms:-Fish, aquatic organisms etc.

Abiotic:-Soil, water, minerals, dissolved oxygen etc.

Wildlife organisms:-Plants, grass, trees, birds and animals.

Abiotic:-Soil, rocks, water etc.

41. Interactions between biotic and abiotic components in a habitat

A. Interaction between biotic and abiotic components

Example:-Earthworms live in moist soil.

B. Interaction between two abiotic components

Example:-The temperature of the day is high due to the bright light of the sun.

C. Interaction between biotic components

Example:-A frog eats insects, a water snake eats fish.

V.

43. Plants such as algae, diatoms, duckweed and lotus are found in lakes.

Animals include frogs, freshwater turtles, snakes, dragonflies, mosquitoes, snails and ducks.

44. The reproductive parts found in the flowers of plants are the stamens and anthers. The mating process between these is called pollination.

Pollination helps in the transfer of pollen from the anthers to the pistils of the flowers by wind, water, insects, bats and birds. This is essential for the formation of fruits and seeds.

## **CHAPTER 13.**

### **OUR HOME: EARTH, A UNIQUE LIFE SUSTAINING PLANET I.**

#### **Answers**

I.

1. B. Earth
2. C. It lacks a thick atmosphere and liquid water
3. B. It would escape into space due to weaker gravity
4. 100 times
5. C. Venus
6. D. Earth
7. D. Mercury
8. C. Three
9. B. Oxygen
10. D. 70%
11. A. Hydrosphere
12. B. Various landforms such as mountains, valleys, and deserts
13. C. 1, 2, 3 and 4
14. A. Half of the parent's genetic material
15. D. They get mixed instructions (genes) from their parents. organisms.

II.

16. In the thinnest layer of the Earth's surface.
17. From the Sun.
18. Mercury.
19. The region around the Sun where water can remain in liquid form is called the Habitable Zone or Goldilocks Zone.
20. Mars.
21. The ozone layer protects Earth from harmful ultraviolet rays coming from the Sun.
22. Earth behaves like a giant magnet.
23. Water
24. The region where magnetic influence can be experienced is called a magnetic field.
25. The movement of molten iron inside Earth causes the Earth's magnetic field.

26. High-energy particles coming from the Sun are called the solar wind.
27. The process by which plants prepare food using carbon dioxide from the air and water from the soil in the presence of sunlight is called photosynthesis.
28. The solid part of Earth consisting of rocks, soil, and minerals is called the geosphere.
29. The variety of landforms, rocks, soils, and the processes that form and change them is called geodiversity.
30. Conserving clean air, water, soil, and all forms of life.
31. Genes
32. Asexual reproduction and sexual reproduction.
33. Vegetative propagation.
34. The transfer of pollen from one flower to another by wind, insects, or animals is called pollination.
35. The fusion of male and female gametes is called fertilization.
36. The zygote develops into a seed. The fleshy part surrounding the ovule develops into a fruit.
37. Long-term changes in temperature, rainfall, and weather patterns are called climate change.
38. Undesirable changes in the physical, chemical, and biological characteristics of the environment are called environmental pollution.
- III.
39. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.
40. Mercury, Venus, Earth, and Mars.
41. Jupiter, Saturn, Uranus, and Neptune.
42. Venus's atmosphere is composed almost entirely of carbon dioxide, which traps heat and prevents it from escaping.
43. Most of Earth's surface is covered with water. From space, the vast amount of water makes Earth appear blue; therefore, Earth is called the Blue Planet.
44. It helps maintain a relatively stable amount of sunlight and heat throughout the year, preventing extremely hot summers or extremely cold winters.
45. Tiny high-energy particles continuously strike Earth from space. Some come from very distant regions of the universe. These are called cosmic rays.
46. Earth's magnetic field acts like a protective shield. It deflects most harmful cosmic rays and solar wind particles, protecting our atmosphere and life on Earth.
47. Sunlight, carbon dioxide, and water.
48. Importance of water:

Maintains water content in the body.

Regulates body temperature.

Helps digestion.

49. Asexual reproduction: A single parent produces new organisms similar to itself.

Sexual reproduction: Genetic information from two parents combines to produce offspring that are not exactly like either parent.

50. Climate change, loss of biodiversity and pollution.

51. Greenhouse gases:

Carbon dioxide

Methane

Cause:

Burning fossil fuels such as coal and petroleum.

52. A. Air Pollution

B. Water Pollution

53. The seeds may have been brought by wind, birds, or water. Moisture, soil, and sunlight helped them grow.

IV. Answer the Following

54. Satellite images help in studying plants on Earth and tiny organisms in the oceans.

They help detect ocean temperatures and oil spills.

They help identify factors such as wind direction.

55. On the earth gases like carbon dioxide in the atmosphere trap heat by absorbing the radiation given off by the earth,

Green House effect plays an important role in maintaining just right temperature on earth.

56.

Solar wind would directly reach Earth.

The atmosphere would gradually weaken.

Living organisms would be at risk.

57. What would happen if Earth did not have a magnetic field?

Cosmic rays and solar wind particles could damage the atmosphere.

More harmful ultraviolet radiation could reach Earth.

Life on Earth could be adversely affected.

58. Earth's crust provides soil for growing plants. It supplies minerals that yield salt, coal, petroleum, iron, copper, and other resources. It supports both ecosystems and human life.

59. Trees, shrubs, herbs, animals, insects, microorganisms, and all other living organisms along with their habitats form the biosphere. The biosphere includes land, water, and air.

60. This is a picture of geodiversity. Different landforms, rocks, and soils on Earth create unique habitats that support a rich variety of life. Abiotic components such as rocks, soil, and water help shape the history of life.

61. Trees, shrubs, herbs, animals, insects, microorganisms, and all other living organisms along with their habitats form the biosphere. The biosphere includes land, water, and air.

62. Prevents species from becoming extinct.

Ensures the continuation of species.

Maintains continuity of life.

63. Adaptation Changes passed from parents to offspring help plants and animals survive better in new environments and continue as improved forms.

Examples:

Over time, camels developed humps to store fat and survive in deserts.

Some bacteria have developed resistance to antibiotics.

64. Vegetative Propagation When a part of a plant such as a leaf, stem, or root is planted in soil and grows into a complete new plant, it is called vegetative propagation.

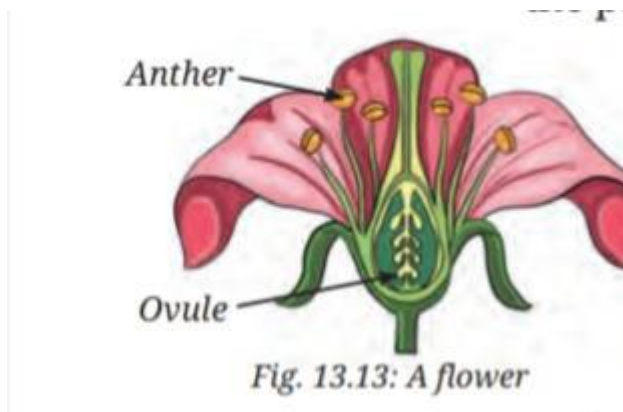
Examples:

Stem cutting of a money plant.

Sprouted eyes of a potato.

Pieces of ginger.

65.



66.

Causes an increase in global temperature.

Can melt glaciers and ice caps.

Can raise sea levels.

Can submerge many coastal regions.

Can cause extreme weather conditions.

Can push many plants and animals toward extinction.

67.

Air pollution

Water pollution

Land pollution

Noise pollution

Radioactive pollution

Thermal pollution

68. Although climate changes occurred in the past, today's changes are happening much faster due to human activities.

69. Air Pollution Sources: Factories, vehicles, and fuel combustion.

Effects:

Harms people and nature.

Causes breathing problems.

Damages crops.

Leads to smog and acid rain.

V.

70.

Earth is at the correct distance from the Sun.

Its temperature allows water to remain in liquid form.

Liquid water is essential for survival, growth, and evolution of life.

Earth lies in the habitable zone.

Earth's orbit is nearly circular.

Earth has the right size.

Earth has an atmosphere necessary for life.

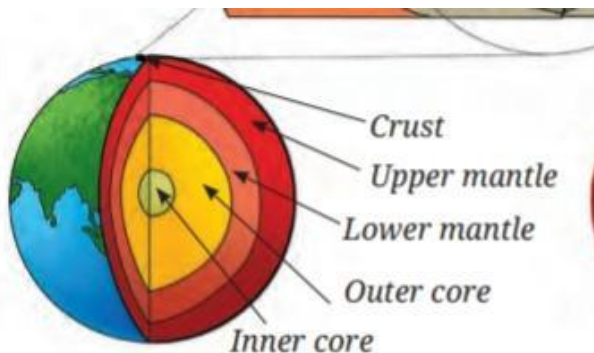
Earth is protected by the ozone layer.

71. If Earth were closer, extreme heat would cause all water to evaporate. If it were farther away, extreme cold would freeze all water. Under such conditions, most plants, animals, and humans could not survive.

72. If Earth were much smaller, its gravity would not be strong enough to hold the atmosphere, and gases would escape into space.

If Earth were much larger, gravity would be much stronger and would pull everything down more forcefully, making life very difficult.

73.



74. Mars Orbiter Mission (Mangalyaan) The Mars Orbiter Mission conducted by Indian Space Research Organisation was a major step in Mars exploration. It helped study the atmosphere and surface of Mars and investigate evidence of past water. It provided answers to important scientific questions about whether Mars may once have supported life. Through Mangalyaan, India demonstrated its ability to conduct space missions using innovative and cost-effective technology.

75.

Offspring inherit characteristics from both parents.

Offspring show variations.

Helps preserve useful traits and introduce new ones.

Small variations accumulate over generations, leading to major changes and the evolution of new forms of life.

76. Water and Soil Pollution Industrial waste, agricultural activities, and plastic waste harm aquatic organisms and make water unsafe. Excessive use of chemical fertilizers and improper waste disposal pollute soil, reduce crop yield, and spread harmful substances through the food chain.

77.

Rainfall may decrease.

Biodiversity declines.

Water quality and availability are reduced.

78. Cause: Climate change.

Solution: Rainwater harvesting and cultivation of drought-resistant crops, growing crops which need less water.

79.

Life could not survive.

There would be extreme temperature differences.

Liquid water would not exist.

VI.

80.

Earth has an atmosphere.

Earth has gravity.

It provides air to breathe, water to drink, and soil for growing crops.

It provides resources such as rocks and wood.

It supports and sustains life, making it a unique planet.

81.

Binary fission

Binary fission

Budding

Fragmentation

Regeneration

82.

Reduce pollution.

Use clean fuels.

Make wise decisions.

Protect the climate.

Use renewable energy sources such as solar and wind energy.

Reduce greenhouse gas emissions.

Use energy efficiently and conserve it.

Choose environmentally friendly modes of transport.

Conserve biodiversity.

Use natural resources wisely.

Reuse, repair, and recycle materials such as paper and plastic.

Reduce pollution and waste.

Save energy and water.

Share awareness and encourage others to take action.

83.

Atmosphere

Water

Food production systems

The most difficult task would be recreating an Earth-like atmosphere because it is a complex and long-term process.

84.

Potato – Sprouted eyes of the potato

Ginger – A piece of ginger rhizome

Onion – Bulb growing from the base

Sugarcane – Stem

Rose – Stem

Hibiscus – Stem