

RAMAN SPACE MANTHAN

DEPARTMENT OF NUCLEAR PHYSICS ISSI

Grade 6 Science Comprehensive Study Notes & MCQ Bank

Curriculum: NCERT Grade 6 Science (Latest Syllabus)

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Target Standard: Advanced / Olympiad Level

CHAPTER 1: THE WONDERFUL WORLD OF SCIENCE

KEY CONCEPTS & ESSENTIAL KEYWORDS

Scientific Method Observation Hypothesis Experimentation Measurement Curiosity Empirical Evidence
Systematic Inquiry

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Science is a systematic and organized endeavor that builds and organizes knowledge in the form of testable explanations and predictions about the universe.
- The process of science relies on key steps: observation, asking questions, forming hypotheses, designing controlled experiments, gathering qualitative and quantitative data, and drawing logical conclusions.
- Curiosity and critical thinking are fundamental driving forces behind all scientific innovations and breakthroughs.
- Scientific measurements require precision and standardized instruments to ensure repeatable, verifiable findings.
- Interdisciplinary science combines physics, chemistry, biology, space science, and environmental studies to solve real-world problems.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Which of the following best defines the core objective of scientific inquiry?

- A) Memorizing historical facts B) Systematic study through observation and experiment
C) Believing unverified assumptions D) Writing fictional stories

Q2. What is the initial step in the classical scientific method?

- A) Formulating a law B) Drawing a final conclusion
C) Making careful observations D) Performing data analysis

Q3. A tentative, testable explanation for an observed phenomenon is called a:

- A) Scientific theory B) Scientific law
C) Hypothesis D) Observation

Q4. Why are standardized measurements critical in scientific experiments?

- A) They make experiments faster
- B) They ensure accuracy and reproducibility
- C) They eliminate the need for equipment
- D) They guarantee desired results

Q5. Which attitude is essential for a successful scientist?

- A) Skepticism and open-mindedness
- B) Dogmatism and rigidity
- C) Hasty conclusions without evidence
- D) Disregarding experimental data

Q6. When an experimental result consistently contradicts a hypothesis, what should a scientist do?

- A) Alter the data to fit the hypothesis
- B) Revise or reject the hypothesis
- C) Ignore the experimental results
- D) Stop doing science

Q7. Which branch of science primarily studies space, celestial bodies, and the universe?

- A) Geology
- B) Astronomy
- C) Botany
- D) Zoology

Q8. Quantitative data collected during an experiment refers to:

- A) Descriptive observations using senses
- B) Numerical values obtained by measurement
- C) Personal feelings and opinions
- D) Visual color changes

Q9. Which tool is specifically designed to measure mass precisely?

- A) Thermometer
- B) Analytical balance
- C) Measuring cylinder
- D) Meter scale

Q10. In a controlled experiment, the variable that is deliberately changed by the scientist is called the:

- A) Dependent variable
- B) Controlled variable
- C) Independent variable
- D) Random variable

Q11. What is the primary role of repeating an experiment multiple times?

- A) To waste laboratory time
- B) To verify consistency and reliability of results
- C) To change the original scientific question
- D) To increase mathematical complexity

Q12. Qualitative scientific observations deal with:

- A) Mass in grams
- B) Descriptions of texture, smell, and color
- C) Volume in milliliters
- D) Temperature in Kelvin

Q13. A well-substantiated explanation of some aspect of the natural world based on a body of facts is a:

- A) Scientific Theory
- B) Pure Guess
- C) Scientific Mystery
- D) Hypothesis

Q14. Which discipline applies principles of physics to celestial mechanics and astrophysics?

- A) Nuclear Physics
- B) Astrobiology
- C) Astrophysics
- D) Meteorology

Q15. What does peer review in scientific publications ensure?

- A) Faster printing of journals
- B) Rigor, accuracy, and validity of scientific work
- C) Commercial success of scientific products
- D) Secrecy of research methods

Q16. Which instrument allows scientists to view microscopic structures like plant cells?

- A) Telescope
- B) Microscope
- C) Periscope
- D) Spectroscope

Q17. Scientific knowledge is considered dynamic because:

- A) It never changes over time
- B) It expands and updates with new evidence
- C) It depends purely on personal beliefs
- D) It is based on single experiments

Q18. Which of the following represents a quantitative observation?

- A) The liquid turned dark blue
- B) The plant grew 4.5 cm in 3 days
- C) The reaction smelled pungent
- D) The powder felt smooth

Q19. An experiment designed to test only one variable at a time while keeping others constant is a:

- A) Uncontrolled test
- B) Controlled experiment
- C) Variable experiment
- D) Theoretical simulation

Q20. Who among the following is historically renowned for pioneering modern observational astronomy?

- A) Isaac Newton
- B) Galileo Galilei
- C) Antoine Lavoisier
- D) Gregor Mendel

Q21. In scientific graphs, the independent variable is conventionally plotted on the:

- A) Y-axis
- B) X-axis
- C) Z-axis
- D) Title block

Q22. What is the main function of a scientific control group?

- A) To act as a baseline for comparison
- B) To receive maximum experimental treatment
- C) To alter the experimental outcome
- D) To confuse the results

Q23. Which skill involves grouping items or organisms based on shared characteristics?

- A) Inference
- B) Prediction
- C) Classification
- D) Calculation

Q24. A logical interpretation or conclusion based on prior knowledge and observations is an:

- A) Observation
- B) Inference
- C) Experiment
- D) Hypothesis

Q25. Which field of science focuses on nuclear reactions and atomic nuclei?

- A) Quantum Mechanics
- B) Organic Chemistry
- C) Nuclear Physics
- D) Thermodynamics

Q26. Why are ethical guidelines necessary in scientific research?

- A) To prevent scientists from making discoveries
- B) To ensure safety, honesty, and humane treatment
- C) To slow down scientific progress
- D) To make science expensive

Q27. Which unit is accepted worldwide under the International System of Units (SI) for time?

- A) Minute
- B) Hour
- C) Second
- D) Day

Q28. A prediction in science is:

- A) A random guess about history
- B) A forecast of future outcomes based on evidence
- C) A proven mathematical law
- D) A final scientific summary

Q29. Which of the following is NOT a safety rule in a science laboratory?

- A) Wear safety goggles when handling chemicals
- B) Taste unknown chemical powders to identify them
- C) Follow all instructions carefully
- D) Report spills immediately

Q30. Science helps humanity primarily by:

- A) Increasing superstitions
- B) Solving problems and improving quality of life
- C) Eliminating curiosity
- D) Discouraging critical thinking

Answer Key - Chapter 1

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	C	C	B	A	B	B	B	B	C	B	B	A	C	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	B	B	B	A	C	B	C	B	C	B	B	B

CHAPTER 2: DIVERSITY IN THE LIVING WORLD

KEY CONCEPTS & ESSENTIAL KEYWORDS

Biodiversity Flora & Fauna Habitat Adaptation Taxonomy Vertebrates Invertebrates Ecosystem

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Biodiversity encompasses the tremendous variety of plants (flora), animals (fauna), and microorganisms living in diverse habitats across Earth.
- Habitats are natural environments (terrestrial, aquatic, aerial, arboreal) that fulfill organisms' basic requirements: food, water, shelter, and breeding conditions.
- Structural, physiological, and behavioral adaptations enable organisms to survive and reproduce in extreme habitats (e.g., thick blubber in polar bears, modified leaves in desert cacti).
- Plants are classified based on structure and life cycle into herbs, shrubs, trees, climbers, and creepers, as well as flowering (angiosperms) and non-flowering (gymnosperms/ferns) types.
- Animals are broadly categorized into invertebrates (lacking a backbone) and vertebrates (possessing a vertebral column: fish, amphibians, reptiles, birds, mammals).

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. The variety of living organisms found in a specific geographic region is termed:

- | | |
|---------------|-----------------|
| A) Ecosystem | B) Biodiversity |
| C) Population | D) Community |

Q2. Which of the following plant categories is characterized by soft, green, and non-woody stems?

- | | |
|-----------|-------------|
| A) Shrubs | B) Trees |
| C) Herbs | D) Climbers |

Q3. Plants that have weak stems and spread horizontally along the ground are called:

- | | |
|-------------|-------------|
| A) Climbers | B) Creepers |
| C) Shrubs | D) Herbs |

Q4. Which structural adaptation is prominent in desert plants (xerophytes) to prevent water loss?

- | | |
|-------------------------|---------------------------------------|
| A) Broad, thin leaves | B) Leaves modified into spines |
| C) Shallow root systems | D) Soft, fleshy stems without cuticle |

Q5. Organisms that possess a true backbone or vertebral column are classified as:

- | | |
|------------------|----------------|
| A) Invertebrates | B) Vertebrates |
| C) Arthropods | D) Mollusks |

Q6. Streamlined body shape in fish is an adaptation designed to:

- A) Help in breathing air
- B) Reduce fluid friction/drag while swimming
- C) Absorb sunlight directly
- D) Store large amounts of fat

Q7. Which of the following is an example of an arboreal animal?

- A) Dolphin
- B) Tree Frog / Monkey
- C) Camel
- D) Earthworm

Q8. Which organ allows fish to extract dissolved oxygen directly from water?

- A) Lungs
- B) Spiracles
- C) Gills
- D) Skin

Q9. Camel's hump stores which substance that provides energy and metabolic water upon oxidation?

- A) Water
- B) Fat
- C) Protein
- D) Carbohydrates

Q10. Pneumatophores (breathing roots) are a characteristic adaptation found in plants of which habitat?

- A) Deserts
- B) Mangrove/Swampy areas
- C) High mountain peaks
- D) Freshwater lakes

Q11. Which of the following animals belongs to the invertebrate group?

- A) Snake
- B) Octopus
- C) Frog
- D) Crow

Q12. Leaves of submerged aquatic plants (hydrophytes) are typically:

- A) Broad and thick with wax
- B) Narrow, ribbon-like, or finely dissected
- C) Modified into sharp spines
- D) Completely absent

Q13. Cold-blooded animals whose body temperature changes with the environmental temperature are called:

- A) Endotherms
- B) Poikilotherms (Ectotherms)
- C) Homeotherms
- D) Isotherms

Q14. To survive extreme winter cold, some animals enter a state of deep prolonged sleep known as:

- A) Aestivation
- B) Hibernation
- C) Camouflage
- D) Migration

Q15. Blubber is a thick layer of subcutaneous fat found in polar mammals primarily for:

- A) Enhancing swimming speed
- B) Thermal insulation against extreme cold
- C) Buoyancy control only
- D) Camouflage against snow

Q16. Which group of plants produces seeds enclosed inside fruits?

- | | |
|----------------|----------------|
| A) Gymnosperms | B) Angiosperms |
| C) Bryophytes | D) Algae |

Q17. Which characteristic distinguishes amphibians from other vertebrates?

- | | |
|--|--|
| A) They lay hard-shelled eggs on land | B) They can live both on land and in water and have moist skin |
| C) They have feathers and hollow bones | D) They possess hair and mammary glands |

Q18. The capability of an animal to blend in with its surroundings to evade predators is called:

- | | |
|----------------|---------------|
| A) Adaptation | B) Camouflage |
| C) Aestivation | D) Mimicry |

Q19. Which animal excretes highly concentrated, solid urine to conserve body water?

- | | |
|--------------------|----------|
| A) Freshwater fish | B) Camel |
| C) Frog | D) Human |

Q20. Floating aquatic plants like Eichhornia (Water Hyacinth) possess air spaces in stems called:

- | | |
|------------|---------------|
| A) Stomata | B) Aerenchyma |
| C) Cuticle | D) Xylem |

Q21. Which of the following is a non-flowering plant that reproduces via spores?

- | | |
|----------|----------|
| A) Rose | B) Fern |
| C) Mango | D) Wheat |

Q22. Insects breathe through specialized tiny openings located on the sides of their bodies called:

- | | |
|--------------|-------------|
| A) Gills | B) Lungs |
| C) Spiracles | D) Tracheae |

Q23. What type of root system is typically associated with plants having parallel leaf venation?

- | | |
|---------------------|-----------------------------|
| A) Taproot system | B) Fibrous root system |
| C) Prop root system | D) Adventitious root system |

Q24. Which feature enables birds to maintain flight efficiently?

- | | |
|----------------------------|---|
| A) Solid heavy bones | B) Pneumatic (hollow) bones and powerful flight muscles |
| C) Cold-blooded metabolism | D) Thick heavy fur |

Q25. Mountain pine trees exhibit a conical shape and sloping branches mainly to:

- | | |
|-------------------------------|--|
| A) Attract flying insects | B) Allow snow and rain to slide off easily |
| C) Block wind flow completely | D) Increase shadow area |

Q26. Saline water habitats populated by salt-tolerant plants are called:

- A) Freshwaters
- B) Halophytic habitats
- C) Xerophytic habitats
- D) Mesophytic habitats

Q27. Which animal undergoes aestivation (summer sleep) to escape heat and drying out?

- A) Polar bear
- B) Garden snail / African Lungfish
- C) Arctic fox
- D) Monarch butterfly

Q28. Earthworms facilitate soil respiration and movement using tiny bristle-like structures called:

- A) Tentacles
- B) Setae
- C) Pseudopodia
- D) Cilia

Q29. The specific place where an organism naturally lives, eats, and reproduces is its:

- A) Niche
- B) Habitat
- C) Biome
- D) Territory

Q30. Which organism acts as a decomposer in the living world?

- A) Green algae
- B) Fungi and bacteria
- C) Herbivorous insects
- D) Apex predators

Answer Key - Chapter 2

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	C	B	B	B	B	B	C	B	B	B	B	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	B	B	B	C	B	B	B	B	B	B	B	B

CHAPTER 3: MINDFUL EATING: A PATH TO HEALTHY BODY

KEY CONCEPTS & ESSENTIAL KEYWORDS

Nutrients Carbohydrates Proteins Fats Vitamins Minerals Balanced Diet Deficiency Diseases

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Food provides essential nutrients required for growth, energy, tissue repair, immune function, and regulation of vital body processes.
- Carbohydrates (starches and sugars) and fats are energy-giving foods; fats yield more energy per unit mass than carbohydrates.
- Proteins are body-building foods necessary for growth, cellular repair, and muscle maintenance.
- Vitamins and minerals are protective foods needed in minor quantities to prevent diseases and ensure optimal metabolic performance.
- Dietary fiber (roughage) aids digestive health and prevents constipation, while water acts as a universal solvent and thermoregulator.
- Deficiency diseases occur when specific nutrients are lacking in the diet over an extended period (e.g., Scurvy from Vitamin C deficiency, Rickets from Vitamin D).

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Which nutrient component serves as the body's primary and quickest source of energy?

- | | |
|-------------|------------------|
| A) Proteins | B) Carbohydrates |
| C) Vitamins | D) Water |

Q2. Which macronutrient provides more than double the energy per gram compared to carbohydrates?

- | | |
|-------------|-------------|
| A) Proteins | B) Fats |
| C) Minerals | D) Roughage |

Q3. Proteins are essential for human health primarily because they:

- | | |
|--------------------------------|-----------------------------|
| A) Provide immediate energy | B) Build and repair tissues |
| C) Insulate the body from cold | D) Transport oxygen in air |

Q4. Which diagnostic chemical reagent turns blue-black when mixed with starch?

- | | |
|-----------------------------|-----------------------|
| A) Copper sulphate solution | B) Iodine solution |
| C) Caustic soda solution | D) Benedict's reagent |

Q5. A translucent grease spot on a piece of paper indicates the presence of:

- | | |
|-------------|------------------|
| A) Starch | B) Fats |
| C) Proteins | D) Mineral salts |

Q6. Deficiency of Vitamin C in the daily diet causes which condition?

- A) Beriberi
- B) Scurvy
- C) Rickets
- D) Night blindness

Q7. Night blindness is characterized by poor vision in dim light and is caused by deficiency of:

- A) Vitamin A
- B) Vitamin B1
- C) Vitamin C
- D) Vitamin D

Q8. Weak bones and soft, bowed legs in growing children (Rickets) result from lack of:

- A) Iron and Vitamin A
- B) Calcium and Vitamin D
- C) Iodine and Vitamin B
- D) Protein and Fats

Q9. Which mineral is indispensable for the synthesis of hemoglobin in red blood cells?

- A) Calcium
- B) Iron
- C) Iodine
- D) Sodium

Q10. Swollen thyroid gland in the neck region (Goitre) is caused by a deficiency of:

- A) Calcium
- B) Iodine
- C) Iron
- D) Zinc

Q11. Dietary fiber or roughage in our food is mainly composed of indigestible:

- A) Starch
- B) Cellulose
- C) Glycogen
- D) Sucrose

Q12. What is the primary role of roughage in the digestive system?

- A) To yield high calories
- B) To add bulk to food and aid bowel movement
- C) To destroy intestinal pathogens
- D) To build muscle tissue

Q13. Which nutrient group is classified as 'Protective Foods'?

- A) Carbohydrates and Fats
- B) Proteins and Fats
- C) Vitamins and Minerals
- D) Water and Roughage

Q14. Deficiency of Vitamin B1 leads to which medical disorder?

- A) Scurvy
- B) Beriberi
- C) Rickets
- D) Anemia

Q15. To test for the presence of proteins, which combination of chemical reagents is used?

- A) Iodine and Ethanol
- B) Copper sulphate and Caustic soda
- C) Hydrochloric acid and Zinc
- D) Barium chloride and Nitrate

Q16. Severe deficiency of both proteins and carbohydrates in infants leads to:

- A) Kwashiorkor and Marasmus
- B) Goitre
- C) Scurvy
- D) Hypertension

Q17. Which vitamin is naturally synthesized by human skin upon exposure to sunlight?

- A) Vitamin A
- B) Vitamin C
- C) Vitamin D
- D) Vitamin K

Q18. A diet containing all essential nutrients in correct proportions, along with roughage and water, is a:

- A) Caloric diet
- B) Balanced diet
- C) Protein-rich diet
- D) Fasting diet

Q19. Which mineral is essential for strong bones and teeth coagulation and muscle contraction?

- A) Iron
- B) Calcium
- C) Potassium
- D) Sulphur

Q20. Overeating fat-rich foods continuously over time leads to excessive accumulation of body fat called:

- A) Anemia
- B) Obesity
- C) Scurvy
- D) Goitre

Q21. Which vitamin plays a crucial role in normal blood clotting to stop bleeding from wounds?

- A) Vitamin A
- B) Vitamin C
- C) Vitamin K
- D) Vitamin E

Q22. Citrus fruits like lemons, oranges, and amla are rich sources of:

- A) Vitamin A
- B) Vitamin C
- C) Vitamin D
- D) Vitamin B12

Q23. Which statement accurately describes 'Mindful Eating'?

- A) Eating as fast as possible
- B) Eating with full awareness of food choices, chewing thoroughly, and listening to hunger cues
- C) Skipping meals to lose weight
- D) Consuming processed snacks while watching TV

Q24. Which of the following is a rich source of plant-based proteins?

- A) Rice
- B) Pulses/Legumes
- C) Butter
- D) Potato

Q25. Water constitutes approximately what percentage of human body weight?

- A) 10-20%
- B) 30-40%
- C) 60-70%
- D) 90-95%

Q26. Anemia is characterized by fatigue and pale skin due to deficiency of:

- A) Iron
- B) Iodine
- C) Calcium
- D) Phosphorus

Q27. Which nutrient helps maintain normal vision and healthy skin?

- A) Vitamin A
- B) Vitamin D
- C) Vitamin K
- D) Iron

Q28. Which food item provides maximum dietary fiber?

- A) Milk
- B) Eggs
- C) Whole grains, fruits, and vegetables
- D) Refined wheat flour (Maida)

Q29. Which cooking practice can destroy heat-sensitive Vitamin C in food?

- A) Washing before cutting
- B) Deep frying and excessive heating
- C) Steaming for a short time
- D) Refrigeration

Q30. Why is junk food considered unhealthy when consumed regularly?

- A) It lacks calories
- B) It is high in refined fats and sugars but poor in essential vitamins, minerals, and fiber
- C) It contains too much roughage
- D) It contains no carbohydrates

Answer Key - Chapter 3

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	B	B	B	A	B	B	B	B	B	C	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
A	C	B	B	B	C	B	B	B	C	A	A	C	B	B

CHAPTER 4: EXPLORING MAGNETS

KEY CONCEPTS & ESSENTIAL KEYWORDS

Magnetism Magnetic Poles Attraction & Repulsion Magnetic Materials Compass Demagnetization
Magnetic Field

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Magnets are materials that attract magnetic substances like iron, nickel, cobalt, and steel.
- Every magnet possesses two poles: North Pole (N) and South Pole (S). Poles always exist in inseparable pairs.
- Fundamental law of magnetism: Like poles repel each other (*N-N, S-S*), while unlike poles attract each other (*N-S*).
- A freely suspended magnet aligns itself along the Earth's geographic North-South direction due to Earth's intrinsic magnetic field.
- Magnetic strength is concentrated heavily at the magnetic poles.
- A magnetic compass uses a pivoted magnetic needle to determine geographical directions.
- Magnets lose their properties upon excessive heating, hammering, or dropping from heights (demagnetization).

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Which naturally occurring mineral was first discovered to possess magnetic properties?

- | | |
|-------------|--------------------------|
| A) Hematite | B) Magnetite (Lodestone) |
| C) Bauxite | D) Quartz |

Q2. Which of the following materials is classified as magnetic?

- | | |
|---------|-------------|
| A) Wood | B) Aluminum |
| C) Iron | D) Plastic |

Q3. When a bar magnet is dipped into iron filings, where do maximum filings stick?

- | | |
|------------------------|---------------------------|
| A) At the exact center | B) Near both ends (poles) |
| C) Uniformly all over | D) Only on one side |

Q4. A freely suspended bar magnet always comes to rest pointing in which direction?

- | | |
|-----------------|------------------|
| A) East - West | B) North - South |
| C) North - East | D) South - West |

Q5. What happens when the North pole of one magnet is brought near the North pole of another magnet?

- | | |
|----------------------|---------------------|
| A) Mutual attraction | B) Mutual repulsion |
| C) No reaction | D) Neutralization |

Q6. Unlike magnetic poles always:

- | | |
|--|------------------------|
| A) Repel each other | B) Attract each other |
| C) Neutralize each other without force | D) Rotate continuously |

Q7. What occurs if a bar magnet is broken into two equal halves?

- | | |
|--|---|
| A) One half becomes North pole, the other South pole | B) Two complete magnets are formed, each with N and S poles |
| C) Both halves lose magnetism completely | D) Magnetic poles disappear |

Q8. Which instrument uses a magnetic needle to find directions on sea and land travel?

- | | |
|----------------|---------------------|
| A) Barometer | B) Magnetic Compass |
| C) Thermometer | D) Speedometer |

Q9. Which technique can cause a permanent magnet to lose its magnetic properties?

- | | |
|-----------------------------------|----------------------------------|
| A) Keeping it in soft iron keeper | B) Heating strongly over a flame |
| C) Cooling in a refrigerator | D) Storing in dark places |

Q10. Which material is non-magnetic?

- | | |
|-----------|-----------|
| A) Nickel | B) Cobalt |
| C) Copper | D) Steel |

Q11. The space around a magnet where its influence can be detected is known as the:

- | | |
|-------------------|------------------------|
| A) Electric field | B) Gravitational field |
| C) Magnetic field | D) Nuclear field |

Q12. Which procedure helps protect magnets from self-demagnetization during storage?

- | | |
|--|------------------------------------|
| A) Storing them in pairs with opposite poles alongside and soft iron keepers across ends | B) Heating them before storage |
| C) Dropping them repeatedly | D) Storing near electronic devices |

Q13. What is the surest test for magnetism in an object?

- | | |
|---------------|--------------|
| A) Attraction | B) Repulsion |
| C) Friction | D) Induction |

Q14. Earth acts like a giant magnet with its magnetic south pole positioned near the geographical:

- | | |
|---------------|-------------------|
| A) North Pole | B) South Pole |
| C) Equator | D) Prime Meridian |

Q15. Can an isolated single magnetic pole (monopole) exist independently?

- | | |
|-------------------------------|---|
| A) Yes, easily isolated | B) No, magnetic poles always exist in pairs |
| C) Yes, only in round magnets | D) Yes, at high temperatures |

Q16. Artificial magnets can be manufactured in various shapes EXCEPT:

- A) Bar magnet
- B) Horse-shoe magnet
- C) Cylindrical magnet
- D) Liquid magnet

Q17. A magnetic compass needle points towards magnetic North because:

- A) It is repelled by North
- B) Earth itself behaves like a magnet
- C) Sun pulls it North
- D) Wind carries it North

Q18. Which of the following electronic devices can be damaged by strong external magnetic fields?

- A) Wooden tables
- B) Credit card magnetic strips and hard drives
- C) Glass beakers
- D) Cotton clothes

Q19. Electromagnets gain magnetism when:

- A) An electric current flows through their coil
- B) They are placed in water
- C) They are heated strongly
- D) They are painted red

Q20. Which metal is commonly used as the core inside an electromagnet?

- A) Copper
- B) Soft Iron
- C) Aluminum
- D) Gold

Q21. If a magnet attracts an unidentified metal bar, can we conclusively say the bar is a magnet?

- A) Yes, absolutely
- B) No, because magnets also attract non-magnetized magnetic materials like iron
- C) Yes, if it is made of copper
- D) No, because magnets attract plastic

Q22. Where is the magnetic strength weakest in a standard bar magnet?

- A) At the North Pole
- B) At the South Pole
- C) At the center of the bar magnet
- D) At both poles equally

Q23. Which shape of magnet resembles a U-shape?

- A) Bar magnet
- B) Ring magnet
- C) Horse-shoe magnet
- D) Button magnet

Q24. What property of lodestone led ancient mariners to use it for navigation?

- A) High density
- B) Directive property when suspended freely
- C) Metallic luster
- D) Ability to float on water

Q25. When a steel needle is stroked repeatedly in one direction with one pole of a magnet, it:

- A) Melts away
- B) Becomes magnetized
- C) Turns into copper
- D) Loses electrical charge

Q26. Why shouldn't magnets be placed near television screens or computer monitors?

- A) Magnetic fields distort electron beams/display components
- B) TV will catch fire instantly
- C) Magnet will turn into plastic
- D) Sound volume will increase

Q27. Which pole of a compass needle usually points towards geographic North?

- A) South magnetic pole of needle
- B) North magnetic pole of needle
- C) East pole
- D) West pole

Q28. A magnetic keeper is made of:

- A) Plastic
- B) Soft Iron
- C) Wood
- D) Glass

Q29. Repulsion will occur between:

- A) North pole and South pole
- B) South pole and South pole
- C) Iron block and North pole
- D) Magnet and copper plate

Q30. Magnets retain their magnetism best when:

- A) Stored properly in pairs with keepers
- B) Dropped from tall buildings
- C) Hammered frequently
- D) Exposed to high heat

Answer Key - Chapter 4

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	C	B	B	B	B	B	B	B	C	C	A	B	A	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
D	B	B	A	B	B	C	C	B	B	A	B	B	B	A

CHAPTER 5: MEASUREMENT OF LENGTH AND MOTION

KEY CONCEPTS & ESSENTIAL KEYWORDS

SI Units Standardization Length Motion Rectilinear Motion Circular Motion Periodic Motion
Curved Line

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Measurement involves comparing an unknown physical quantity with a fixed known standard quantity (unit).
- Ancient non-standard units (handspan, cubit, pace) varied per person, necessitating the International System of Units (SI).
- The SI standard unit of length is the Meter (m). $1\text{ m} = 100\text{ cm} = 1000\text{ mm}$; $1\text{ km} = 1000\text{ m}$.
- Accurate length measurement requires proper scale positioning, eye alignment perpendicular to the mark (to eliminate parallax error), and accounting for damaged scale ends.
- Curved lines are measured using flexible thread and a standard ruler.
- Motion is the change in position of an object over time relative to a fixed reference point.
- Types of motion: Rectilinear (straight line), Circular (path along a circle), Periodic (repeats at regular intervals), and Rotational (spinning around an axis).

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. The standard unit of length in the International System of Units (SI) is:

- | | |
|---------------|---------------|
| A) Centimeter | B) Kilometer |
| C) Meter | D) Millimeter |

Q2. How many millimeters (mm) are equivalent to 1 meter (m)?

- | | |
|--------------|------------|
| A) 100 mm | B) 1000 mm |
| C) 10,000 mm | D) 10 mm |

Q3. Which unit is most appropriate for expressing the distance between two far cities like Delhi and Mumbai?

- | | |
|--------------|---------------|
| A) Meter | B) Centimeter |
| C) Kilometer | D) Millimeter |

Q4. Parallax error in length measurement occurs due to:

- | | |
|------------------------------------|--|
| A) Using a broken scale | B) Incorrect positioning of the eye relative to the measurement mark |
| C) Environmental thermal expansion | D) Fluctuations in gravity |

Q5. Which non-standard unit of length is based on the distance from the elbow to the tip of the middle finger?

- | | |
|-------------|-------------|
| A) Handspan | B) Cubit |
| C) Pace | D) Footstep |

Q6. Motion of an object along a straight line path is termed:

- | | |
|--------------------|-----------------------|
| A) Circular motion | B) Rectilinear motion |
| C) Periodic motion | D) Oscillatory motion |

Q7. The movement of hands of a clock represents which combination of motions?

- | | |
|-----------------------------|---------------------------------|
| A) Rectilinear and periodic | B) Circular and periodic motion |
| C) Random and non-periodic | D) Oscillatory and rectilinear |

Q8. A simple pendulum oscillating back and forth exhibits:

- | | |
|---------------------------|----------------------------------|
| A) Rectilinear motion | B) Periodic / Oscillatory motion |
| C) Rotational motion only | D) Random motion |

Q9. How should the length of a curved line be accurately measured?

- | | |
|--|--|
| A) Direct application of a rigid steel scale | B) Using a flexible thread along the curve, then measuring the thread on a scale |
| C) Guessing visually | D) Multiplying width by height |

Q10. Which of the following is an example of rectilinear motion?

- | | |
|---|---|
| A) A stone tied to a string swung in a circle | B) A marching parade of soldiers on a straight road |
| C) A spinning top | D) A swinging pendulum |

Q11. Motion that repeats itself after equal, regular intervals of time is called:

- | | |
|------------------------|--------------------------|
| A) Non-periodic motion | B) Periodic motion |
| C) Random motion | D) Uniform linear motion |

Q12. A spinning bicycle wheel demonstrates which type of motion around its central axle?

- | | |
|-------------------------|----------------------|
| A) Rectilinear motion | B) Rotational motion |
| C) Periodic motion only | D) Random motion |

Q13. Which factor must be avoided to ensure accurate ruler readings?

- | | |
|--|---|
| A) Placing ruler parallel to length | B) Looking at the reading at an oblique angle |
| C) Starting from 1.0 cm mark if 0 cm is worn out | D) Keeping ruler flat |

Q14. If a scale's zero mark is damaged, reading starts at 1.0 cm and ends at 14.5 cm. The actual length is:

- | | |
|------------|------------|
| A) 14.5 cm | B) 13.5 cm |
| C) 15.5 cm | D) 14.0 cm |

Q15. Motion of a fly buzzing randomly inside a room is an example of:

- | | |
|--------------------|-----------------------|
| A) Periodic motion | B) Circular motion |
| C) Random motion | D) Rectilinear motion |

Q16. 1 kilometer (km) equals how many centimeters (cm)?

- A) 10,000 cm
- B) 1,000,000 cm
- C) 100,000 cm
- D) 1,000 cm

Q17. The motion of Earth spinning on its geographical axis is:

- A) Rotational motion
- B) Rectilinear motion
- C) Random motion
- D) Oscillatory motion

Q18. The revolution of Earth around the Sun once every 365.25 days is:

- A) Periodic motion
- B) Rectilinear motion
- C) Non-periodic motion
- D) Random motion

Q19. Which device is used by tailors to measure chest and waist dimensions accurately?

- A) Rigid wooden meter scale
- B) Measuring tape (flexible)
- C) Vernier caliper
- D) Micrometer screw gauge

Q20. An object is said to be in motion if:

- A) Its position remains fixed with respect to surroundings
- B) Its position changes relative to a reference point with time
- C) It remains stationary forever
- D) It reflects light

Q21. A child on a moving swing exhibits:

- A) Periodic motion
- B) Rectilinear motion
- C) Rotational motion
- D) Circular motion

Q22. The blade motion of an operating ceiling fan is an example of:

- A) Rotational motion
- B) Rectilinear motion
- C) Random motion
- D) Oscillatory motion

Q23. Why are ancient units like handspan unreliable for standard scientific measurements?

- A) They were too difficult to spell
- B) Body proportions vary from individual to individual
- C) They were too precise
- D) They were based on metric systems

Q24. In 1790, which country created the standardized Metric System of units?

- A) Great Britain
- B) France
- C) United States
- D) Germany

Q25. The motion of a plucked guitar string is:

- A) Periodic / Vibrational motion
- B) Rectilinear motion
- C) Circular motion
- D) Random motion

Q26. 1 centimeter (cm) is divided into how many equal small divisions?

- A) 5 mm
- B) 10 mm
- C) 100 mm
- D) 50 mm

Q27. A car driving along a straight highway displays:

- A) Rectilinear motion
- B) Periodic motion
- C) Circular motion
- D) Oscillatory motion

Q28. What type of motion is executed by a striker moving across a carrom board?

- A) Rectilinear motion
- B) Rotational motion
- C) Periodic motion
- D) Circular motion

Q29. Which unit is smallest among the following: meter, millimeter, kilometer, centimeter?

- A) Meter
- B) Millimeter
- C) Kilometer
- D) Centimeter

Q30. To measure the girth of a large banyan tree trunk, which instrument is best suited?

- A) 15 cm plastic ruler
- B) Flexible measuring tape
- C) Divider
- D) Thread only without scale

Answer Key - Chapter 5

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
C	B	C	B	B	B	B	B	B	B	B	B	B	B	C
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
C	A	A	B	B	A	A	B	B	A	B	A	A	B	B

CHAPTER 6: MATERIALS AROUND US

KEY CONCEPTS & ESSENTIAL KEYWORDS

Matter Properties of Materials Luster Hardness Solubility Transparency Density Classification

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Everything around us is composed of matter, which possesses mass and occupies space.
- Materials are classified based on physical properties: appearance (luster/dullness), hardness/softness, solubility in water, transparency, density (floating/sinking), and magnetic attraction.
- Luster: Metals like gold, copper, and iron possess shiny lusters, whereas wood and chalk are non-lustrous.
- Solubility: Substances that dissolve completely in water are soluble (e.g., sugar, salt); those that do not dissolve are insoluble (e.g., sand, mustard oil).
- Transparency: Materials are classified as Transparent (clear light transmission - glass, pure water), Translucent (partial light transmission - frosted glass, butter paper), or Opaque (blocks light completely - wood, steel).

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Materials that shine brightly when freshly cut or polished are described as:

- | | |
|----------------|-------------|
| A) Dull | B) Lustrous |
| C) Translucent | D) Opaque |

Q2. Which of the following materials possesses metallic luster?

- | | |
|-----------------|------------------|
| A) Wood block | B) Copper wire |
| C) Chalk powder | D) Plastic ruler |

Q3. Substances that can be compressed or scratched easily with soft force are termed:

- | | |
|------------|-------------|
| A) Hard | B) Soft |
| C) Brittle | D) Flexible |

Q4. Which of the following substances is completely soluble in water?

- | | |
|------------|-----------------------|
| A) Sand | B) Common Salt (NaCl) |
| C) Sawdust | D) Chalk dust |

Q5. When mustard oil is mixed with water, it forms a separate layer because it is:

- | | |
|----------------|---------------------------|
| A) Soluble | B) Immiscible / Insoluble |
| C) Transparent | D) High density |

Q6. Objects through which light passes completely and clearly are classified as:

- | | |
|----------------|----------------|
| A) Opaque | B) Translucent |
| C) Transparent | D) Luminous |

Q7. A piece of butter paper or frosted glass is an example of a material that is:

- | | |
|---------------------------|----------------|
| A) Completely transparent | B) Translucent |
| C) Opaque | D) Luminous |

Q8. Which material will float on the surface of clean water?

- | | |
|-----------------|---------------------------|
| A) Iron nail | B) Dry wooden leaf / Cork |
| C) Marble stone | D) Glass marble |

Q9. Why are metals like copper and aluminum used to make cooking utensils?

- | | |
|-------------------------------------|-------------------------|
| A) They are good thermal conductors | B) They are transparent |
| C) They float on water | D) They dissolve easily |

Q10. Which of the following gas dissolves in natural water systems supporting aquatic animal life?

- | | |
|-------------|-----------|
| A) Nitrogen | B) Oxygen |
| C) Methane | D) Argon |

Q11. An opaque material is one that:

- | | |
|--|--------------------------------------|
| A) Allows light to pass through completely | B) Allows partial light transmission |
| C) Does not allow light to pass through at all | D) Generates its own light |

Q12. Which substance will sink when dropped into water?

- | | |
|--------------|-----------------|
| A) Dry leaf | B) Wooden block |
| C) Iron coin | D) Ice cube |

Q13. Grouping objects together based on similarities and differences in their properties is called:

- | | |
|----------------|-------------------|
| A) Filtration | B) Classification |
| C) Evaporation | D) Condensation |

Q14. Which of the following is an example of an opaque object?

- | | |
|----------------------|--------------------------|
| A) Clear glass plate | B) Plywood sheet |
| C) Air | D) Clean water container |

Q15. Which liquid is completely miscible in water?

- | | |
|----------------|--------------------------|
| A) Kerosene | B) Vinegar / Lemon juice |
| C) Coconut oil | D) Diesel |

Q16. Diamond is famous for being the world's most:

- | | |
|---------------------------------------|---------------------------------------|
| A) Soft naturally occurring substance | B) Hard naturally occurring substance |
| C) Soluble mineral | D) Translucent gas |

Q17. Why are clear glass containers preferred in grocery stores for displaying sweets?

- A) Glass is opaque
- B) Glass is transparent, allowing clear visibility
- C) Glass is soft
- D) Glass is magnetic

Q18. Substances that do not dissolve in water and settle at the bottom over time are:

- A) Soluble and lighter
- B) Insoluble and denser than water
- C) Miscible liquids
- D) Gaseous elements

Q19. Which of the following is NOT a property of matter?

- A) Having mass
- B) Occupying space
- C) Total weightlessness in all conditions
- D) Having volume

Q20. Which material can be scratched easily by a brass key?

- A) Iron rod
- B) Candle wax / Soap
- C) Diamond plate
- D) Hardened steel

Q21. Air is considered:

- A) Opaque and green
- B) Transparent and colorless
- C) Translucent and blue
- D) Solid and shiny

Q22. Which gas is responsible for the effervescence/fizz in carbonated soft drinks?

- A) Oxygen
- B) Carbon Dioxide
- C) Hydrogen
- D) Nitrogen

Q23. If an object has a density greater than water, it will:

- A) Float on water
- B) Sink in water
- C) Dissolve instantly
- D) Evaporate

Q24. Which of the following is non-lustrous?

- A) Gold ring
- B) Silver spoon
- C) Cardboard sheet
- D) Aluminum foil

Q25. Substances like glycerine and alcohol that mix completely with water are termed:

- A) Immiscible
- B) Miscible
- C) Insoluble
- D) Opaque

Q26. Why are handles of cooking pans made of bakelite or wood?

- A) They are good thermal conductors
- B) They are poor thermal conductors (insulators)
- C) They are highly lustrous
- D) They are transparent

Q27. Which pair consists of one soluble and one insoluble substance in water?

- A) Sugar and Salt
- B) Salt and Sand
- C) Sand and Sawdust
- D) Oil and Kerosene

Q28. Materials that can be drawn into thin wires are ductile; this property is usually shown by:

- A) Plastics
- B) Wood
- C) Metals
- D) Ceramics

Q29. What happens to the luster of metallic items over long exposure to moist air?

- A) It increases permanently
- B) It tarnishes due to reaction with air and moisture
- C) It turns transparent
- D) It dissolves completely

Q30. The main purpose of classifying materials in daily life and science is:

- A) To make things look colorful
- B) For convenience and systematic study of properties
- C) To increase weight
- D) To confuse observers

Answer Key - Chapter 6

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	B	B	C	B	B	A	B	C	C	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	C	B	B	B	B	C	B	B	B	C	B	B

CHAPTER 7: TEMPERATURE AND ITS MEASUREMENT

KEY CONCEPTS & ESSENTIAL KEYWORDS

Temperature Thermometer Celsius Scale Fahrenheit Scale Kelvin Clinical Thermometer
Laboratory Thermometer Thermal Expansion

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Temperature measures the degree of hotness or coldness of a body or environment.
- Thermometers operate on thermal expansion — liquids like mercury or alcohol expand uniformly when heated.
- Clinical Thermometers measure human body temperature (Range: 35°C to 42°C or 95°F to 108°F). Normal human body temperature is approximately 37°C (98.6°F).
- A constriction (kink) in clinical thermometers prevents mercury column backflow when removed from the mouth.
- Laboratory Thermometers measure scientific experiment temperatures (Typical range: -10°C to 110°C) and lack a kink.
- Digital Thermometers replace toxic mercury with electronic thermistors.
- Temperature scales: Celsius (°C), Fahrenheit (°F), Kelvin (K - SI standard unit). Conversion formula: $F = (9/5 \times C) + 32$.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Temperature measures which fundamental thermal property of a body?

- | | |
|----------------------|----------------------------------|
| A) Total heat energy | B) Degree of hotness or coldness |
| C) Mass of liquid | D) Volume expansion rate |

Q2. What is the SI standard unit for measuring temperature?

- | | |
|------------------------|---------------------------|
| A) Degree Celsius (°C) | B) Degree Fahrenheit (°F) |
| C) Kelvin (K) | D) Joule (J) |

Q3. What is the normal core temperature of a healthy human body?

- | | |
|-----------------|------------------|
| A) 35°C (95°F) | B) 37°C (98.6°F) |
| C) 39°C (102°F) | D) 40°C (104°F) |

Q4. What is the measurement range of a standard mercury Clinical Thermometer?

- | | |
|-------------------|-----------------|
| A) -10°C to 110°C | B) 35°C to 42°C |
| C) 0°C to 100°C | D) 20°C to 50°C |

Q5. What is the primary function of the constriction (kink) in a clinical thermometer tube?

- | | |
|---|--|
| A) To make reading easier by magnifying mercury | B) To prevent mercury from falling back into the bulb automatically before reading |
| C) To break the glass easily | D) To accelerate thermal expansion |

Q6. Which liquid metal was traditionally used in glass thermometers due to uniform expansion?

- A) Water
- B) Alcohol
- C) Mercury
- D) Sodium

Q7. What is the typical working temperature range of a Laboratory Thermometer?

- A) 35°C to 42°C
- B) -10°C to 110°C
- C) 0°C to 50°C
- D) 10°C to 200°C

Q8. Modern digital thermometers are increasingly preferred over traditional mercury thermometers because:

- A) Mercury is toxic and difficult to dispose of if broken
- B) Digital thermometers use glass tubes
- C) Digital thermometers require heating over flames
- D) Digital thermometers are slower

Q9. What is the freezing point of pure water on the Celsius scale at standard atmospheric pressure?

- A) 100°C
- B) 0°C
- C) 32°C
- D) 273°C

Q10. What is the boiling point of pure water on the Celsius scale at sea level?

- A) 0°C
- B) 100°C
- C) 212°C
- D) 373°C

Q11. Which formula correctly relates degrees Fahrenheit (*F*) to degrees Celsius (*C*)?

- A) $F = (9/5 \times C) + 32$
- B) $F = (5/9 \times C) - 32$
- C) $F = C + 273$
- D) $F = 9/5 + C$

Q12. Convert 0°C into the Kelvin scale:

- A) 0 K
- B) 100 K
- C) 273.15 K
- D) -273 K

Q13. Why shouldn't a clinical thermometer be used to measure boiling hot milk?

- A) It will measure it accurately
- B) Its narrow range (up to 42°C) will cause the glass bulb to break due to excessive expansion
- C) Milk turns mercury into solid
- D) Milk will ruin the kink

Q14. When reading a laboratory thermometer inserted in hot water, the reading must be taken:

- A) After removing it from water for 5 minutes
- B) While the thermometer bulb is still immersed in the liquid
- C) After shaking it vigorously
- D) By turning it upside down

Q15. What is the freezing point of water expressed on the Fahrenheit scale?

- A) 0°F
- B) 32°F
- C) 100°F
- D) 212°F

Q16. What is the boiling point of water expressed on the Fahrenheit scale?

- A) 100°F
- B) 212°F
- C) 180°F
- D) 373°F

Q17. Why is alcohol used instead of mercury in thermometers designed for extremely cold arctic regions?

- A) Alcohol has a much lower freezing point than mercury
- B) Alcohol boils at higher temperature than mercury
- C) Alcohol is cheaper
- D) Alcohol is heavier than mercury

Q18. Which device is used to measure maximum and minimum daily atmospheric temperatures for weather reports?

- A) Clinical thermometer
- B) Maximum-Minimum Thermometer
- C) Pyrometer
- D) Digital clinical probe

Q19. Before using a clinical thermometer, why is it given a few firm jerks?

- A) To heat up the bulb
- B) To bring the mercury level down into the bulb below 35°C
- C) To remove air bubbles from glass
- D) To mix chemicals inside

Q20. Which thermometer uses infrared radiation emitted from the ear or forehead without contact?

- A) Mercury clinical thermometer
- B) Infrared (Non-contact) Thermometer
- C) Laboratory thermometer
- D) Alcohol thermometer

Q21. If two objects are at the same temperature, what can be stated about heat transfer between them?

- A) Heat flows rapidly from object A to B
- B) No net heat transfer occurs between them (thermal equilibrium)
- C) Heat flows from object B to A
- D) Both objects lose all heat

Q22. Which state of matter expands the most for a given rise in temperature?

- A) Solids
- B) Liquids
- C) Gases
- D) All expand equally

Q23. What scale range division is usually found on a standard clinical Celsius thermometer?

- A) 1°C divisions
- B) 0.1°C divisions
- C) 5°C divisions
- D) 10°C divisions

Q24. If a patient's body temperature is recorded as 100.4°F, they are considered to have:

- A) Hypothermia
- B) Mild fever
- C) Normal body temperature
- D) Freezing body temperature

Q25. Absolute Zero, the theoretical temperature where all molecular motion ceases, corresponds to:

- A) 0°C
- B) -273.15°C (0 K)
- C) -100°C
- D) 32°F

Q26. Why should the bulb of a laboratory thermometer not touch the bottom or sides of the beaker container?

- A) It will break the beaker
- B) It measures container wall temperature rather than the liquid temperature
- C) Mercury will leak into water
- D) Thermometer will lose its scale

Q27. How many division intervals exist between boiling point and freezing point of water on the Fahrenheit scale?

- A) 100
- B) 180
- C) 273
- D) 50

Q28. Which property of liquids makes them suitable for liquid-in-glass thermometers?

- A) High transparency
- B) Uniform thermal expansion with temperature change
- C) Low density
- D) High chemical acidity

Q29. What reading on the Celsius scale corresponds to 98.6°F?

- A) 35°C
- B) 37°C
- C) 40°C
- D) 42°C

Q30. Why should a mercury clinical thermometer never be washed with boiling hot water?

- A) It destroys the print
- B) High temperature expands mercury beyond 42°C, breaking the glass tube
- C) Hot water neutralizes mercury
- D) Mercury evaporates through glass

Answer Key - Chapter 7

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	C	B	B	B	C	B	A	B	B	A	C	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	A	B	B	B	B	C	B	B	B	B	B	B	B	B

CHAPTER 8: A JOURNEY THROUGH STATES OF WATER

KEY CONCEPTS & ESSENTIAL KEYWORDS

States of Matter Water Cycle Evaporation Condensation Freezing Melting Transpiration Precipitation

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Water naturally exists in three physical states: Solid (Ice, Snow), Liquid (Water), and Gas (Water Vapor/Steam).
- State transitions: Evaporation (liquid to gas), Condensation (gas to liquid), Freezing (liquid to solid), Melting (solid to liquid), and Sublimation (solid to gas).
- Water Cycle is the continuous movement of water on, above, and below Earth's surface through evaporation, transpiration, condensation, precipitation, and runoff.
- Transpiration: Evaporation of excess water from plant leaf surfaces via stomatal pores.
- Precipitation occurs when condensed water droplets in clouds become too heavy to stay suspended and fall as rain, snow, or hail.
- Water conservation through techniques like rainwater harvesting is essential for ecological stability.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. The process of conversion of liquid water into water vapor at temperatures below its boiling point is called:

- | | |
|-----------------|----------------|
| A) Condensation | B) Evaporation |
| C) Sublimation | D) Freezing |

Q2. The transition of water vapor back into liquid water droplets upon cooling is known as:

- | | |
|----------------|------------------|
| A) Evaporation | B) Condensation |
| C) Melting | D) Transpiration |

Q3. Loss of water vapor from aerial parts of plants, mainly through leaf stomata, is called:

- | | |
|----------------|------------------|
| A) Evaporation | B) Transpiration |
| C) Respiration | D) Precipitation |

Q4. Water drops forming on the outer cold surface of a glass containing ice water is due to:

- | | |
|---|--|
| A) Evaporation of water from inside glass | B) Condensation of atmospheric water vapor on cold glass surface |
| C) Seepage of water through solid glass | D) Chemical reaction of glass |

Q5. The continuous circular movement of water between Earth's surface and atmosphere is the:

- | | |
|-------------------------------------|-------------------|
| A) Carbon cycle | B) Nitrogen cycle |
| C) Water cycle (Hydrological cycle) | D) Oxygen cycle |

Q6. At what temperature does pure liquid water freeze into solid ice under standard pressure?

- A) 100°C
- B) 0°C
- C) 50°C
- D) -10°C

Q7. Clouds in the atmosphere are formed by:

- A) Burning of fossil fuels
- B) Condensation of tiny water droplets around floating dust particles high in the air
- C) Melting of mountain glaciers directly
- D) Oxygen gas reacting with nitrogen

Q8. Which factor increases the rate of evaporation of water?

- A) Decreasing temperature
- B) Increasing surface area and wind speed
- C) Increasing humidity
- D) Keeping liquid in closed containers

Q9. Rain, snow, sleet, and hail falling from clouds to Earth are forms of:

- A) Transpiration
- B) Precipitation
- C) Sublimation
- D) Evaporation

Q10. Water stored deep below Earth's surface in soil layers and rock crevices is called:

- A) Surface water
- B) Ground water
- C) Atmospheric water
- D) Rainwater runoff

Q11. Solid ice directly converting into water vapor without turning into liquid is called:

- A) Evaporation
- B) Sublimation
- C) Condensation
- D) Fusion

Q12. Which phenomenon leads to drought conditions in a region?

- A) Excessive heavy rainfall over short duration
- B) Lack of rainfall over a prolonged period leading to dry soil and falling water table
- C) Rapid snow melting on mountains
- D) Increased transpiration in forests

Q13. Heavy and continuous rainfall over a short duration leading to overflowing rivers causes:

- A) Drought
- B) Floods
- C) Dew formation
- D) Water scarcity

Q14. The process of collecting and storing rainwater directly from rooftops for future use is called:

- A) Ground irrigation
- B) Rainwater Harvesting
- C) Water distillation
- D) Dam filtering

Q15. What is dew?

- A) Frozen snow on high mountain tops
- B) Water vapor condensed directly onto cold surface objects like grass during night
- C) Rain falling during summer afternoon
- D) Underground water springs

Q16. Why does wet laundry dry faster on a windy, sunny day?

- A) Low temperature stops evaporation
- B) High temperature and wind speed accelerate the rate of evaporation
- C) Humidity is 100%
- D) Sunlight turns water into solid

Q17. Fog observed on cold winter mornings is an example of:

- A) Water vapor condensed near ground level around air particles
- B) Pure smoke from burning wood
- C) Evaporated steam rising into space
- D) Oxygen gas freezing

Q18. What percentage of Earth's total surface area is covered by water oceans and seas?

- A) ~30%
- B) ~50%
- C) ~71%
- D) ~95%

Q19. Why is ocean water unsuitable for direct human drinking or agricultural irrigation?

- A) It contains high concentrations of dissolved mineral salts (saline water)
- B) It has zero dissolved oxygen
- C) It is always frozen
- D) It contains toxic acids

Q20. The level of groundwater underground is represented by the upper limit known as the:

- A) Aquifer limit
- B) Water Table
- C) River bed level
- D) Cloud line

Q21. Which process absorbs thermal energy from the environment, producing a cooling effect?

- A) Condensation
- B) Evaporation
- C) Freezing
- D) Solidification

Q22. What happens to water volume when liquid water freezes into solid ice?

- A) Volume decreases
- B) Volume expands/increases slightly
- C) Volume remains identical
- D) Volume drops to zero

Q23. Ice floats on liquid water surface because:

- A) Ice is denser than liquid water
- B) Ice is less dense than liquid water
- C) Ice is hotter than water
- D) Ice has no mass

Q24. The natural process by which ocean water becomes fresh rain water on land is:

- A) Industrial distillation
- B) Natural Water Cycle
- C) Artificial filtration
- D) Deep well pumping

Q25. High atmospheric humidity means:

- A) Air contains very low water vapor
- B) Air is saturated with a high amount of water vapor
- C) Air is extremely cold and dry
- D) No clouds can form

Q26. Gaseous water vapor is:

- A) Dark blue in color with pungent odor
- B) Colorless, odorless, and invisible
- C) White smoky liquid
- D) Solid crystalline dust

Q27. When hail falls during a thunderstorm, it is composed of:

- A) Liquid rain droplets
- B) Frozen solid ice balls
- C) Condensed steam
- D) Atmospheric dust

Q28. Which state of water has a fixed shape and fixed volume?

- A) Ice (Solid)
- B) Water (Liquid)
- C) Steam (Gas)
- D) Fog

Q29. How does deforestation negatively impact the water cycle?

- A) Increases rain frequency
- B) Reduces transpiration, alters local rainfall patterns, and increases soil erosion
- C) Increases groundwater levels
- D) Eliminates evaporation entirely

Q30. Water present in rivers, lakes, ponds, and reservoirs is classified as:

- A) Marine water
- B) Surface freshwater
- C) Deep underground aquifer
- D) Atmospheric vapor

Answer Key - Chapter 8

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	B	C	B	B	B	B	B	B	B	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	A	C	A	B	B	B	B	B	B	B	B	A	B	B

CHAPTER 9: METHODS OF SEPARATION IN EVERYDAY LIFE

KEY CONCEPTS & ESSENTIAL KEYWORDS

Mixtures Handpicking Threshing Winnowing Sieving Sedimentation Decantation Filtration
Evaporation Saturated Solution

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Mixtures contain two or more substances combined physically in variable proportions.
- Solid-Solid Separation Methods: Handpicking (size/shape difference), Threshing (separating grains from stalks), Winnowing (separating light husk using wind), Sieving (particle size difference using mesh).
- Insoluble Solid-Liquid Separation: Sedimentation (heavy insoluble particles settle), Decantation (pouring off top clear liquid), Filtration (using porous filter like paper/cloth).
- Soluble Solid-Liquid Separation: Evaporation (heating to drive off liquid, leaving solid solute), Condensation (recovering liquid).
- Saturated Solution: A solution in which no more solute can dissolve at a specific given temperature.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Which separation technique is best suited to remove small stones from rice grains manually?

- | | |
|---------------|----------------|
| A) Winnowing | B) Handpicking |
| C) Filtration | D) Decantation |

Q2. Separating wheat grains from harvested dry stalks by beating them against hard surface is called:

- | | |
|--------------|------------------|
| A) Winnowing | B) Threshing |
| C) Sieving | D) Sedimentation |

Q3. Winnowing separates lighter husk components from heavier food grains utilizing the force of:

- | | |
|------------------------|-------------------------------|
| A) Gravity alone | B) Moving wind / air currents |
| C) Magnetic attraction | D) Heat energy |

Q4. Which separation method uses a mesh screen to separate particles of different physical sizes?

- | | |
|----------------|------------------|
| A) Sieving | B) Sedimentation |
| C) Evaporation | D) Decantation |

Q5. Allowing heavy insoluble solids in a liquid mixture to settle at the bottom of container is:

- | | |
|----------------|------------------|
| A) Decantation | B) Sedimentation |
| C) Filtration | D) Evaporation |

Q6. Pouring out clear upper liquid gently without disturbing the settled bottom sediment is:

- A) Sedimentation
- B) Decantation
- C) Sieving
- D) Centrifugation

Q7. Which technique separates insoluble tea leaves completely from prepared tea liquid using a fine mesh strainer?

- A) Evaporation
- B) Filtration
- C) Threshing
- D) Winnowing

Q8. Pure common salt (NaCl) is harvested from seawater commercial beds by the natural process of:

- A) Filtration
- B) Evaporation
- C) Sedimentation
- D) Decantation

Q9. A solution in which no additional amount of solute can dissolve at that current temperature is:

- A) Unsaturated solution
- B) Saturated solution
- C) Super-dilute solution
- D) Concentrated acid

Q10. What happens to the solubility of sugar in water when the water temperature is increased by heating?

- A) Solubility decreases
- B) Solubility increases
- C) Solubility remains completely unchanged
- D) Sugar turns into salt

Q11. In a sugar syrup solution, sugar acts as the solute while water acts as the:

- A) Solution
- B) Solvent
- C) Precipitate
- D) Sediment

Q12. How can mud particles suspended in turbid river water be settled down rapidly?

- A) Adding common salt
- B) Adding a small piece of Alum (Loading)
- C) Boiling the water vigorously
- D) Adding oil

Q13. Which filter medium can remove extremely fine micro-particles or bacteria from muddy water?

- A) Coarse wire mesh
- B) Filter paper with microscopic pores
- C) Plastic sieve
- D) Bamboo basket

Q14. Cream is churned and separated from milk/curd utilizing differences in density by:

- A) Filtration
- B) Centrifugation / Churning
- C) Winnowing
- D) Evaporation

Q15. Grain husk is separated from flour at wheat flour mills by using:

- A) Sieving
- B) Sedimentation
- C) Evaporation
- D) Filtration

Q16. Butter is separated from churned buttermilk based on the principle of:

- A) Evaporation
- B) Density difference (floating of fat)
- C) Magnetic attraction
- D) Filtration

Q17. When a mixture of iron nails and sand needs separation, the most efficient method is:

- A) Handpicking
- B) Magnetic separation using a magnet
- C) Winnowing
- D) Sieving

Q18. Filtration cannot separate which type of mixture?

- A) Chalk powder in water
- B) Fully dissolved sugar in water
- C) Sand in water
- D) Sawdust in water

Q19. Which process converts liquid water into vapor to recover dissolved solid salt?

- A) Condensation
- B) Evaporation
- C) Decantation
- D) Threshing

Q20. The combination of evaporation followed immediately by condensation to obtain pure liquid is:

- A) Filtration
- B) Distillation
- C) Loading
- D) Winnowing

Q21. In winnowing, where does the lighter husk fall relative to the heavier grains?

- A) Further away in direction of wind
- B) Directly at the feet of farmer alongside grains
- C) It floats away into space forever
- D) It falls faster than grains

Q22. Why is sieving unsuitable for separating wheat flour from finely ground sugar?

- A) Both pass through sieve mesh due to similar small particle size
- B) Sugar turns into liquid on sieve
- C) Flour becomes magnetic
- D) Sieve gets destroyed

Q23. The process of adding alum to accelerate settling of fine clay particles in water is:

- A) Sedimentation
- B) Loading
- C) Decantation
- D) Distillation

Q24. Which method is used in daily households to separate paneer (cottage cheese) curds from liquid whey?

- A) Winnowing
- B) Filtration using fine muslin cloth
- C) Evaporation
- D) Magnetic separation

Q25. Can oil mixed with water be separated using a separating funnel based on immiscibility?

- A) Yes, oil forms top layer and water forms bottom layer
- B) No, they dissolve into each other completely
- C) No, oil evaporates instantly
- D) Yes, using magnetic pull

Q26. If you heat a saturated solution of salt in water, what happens to its capacity to dissolve more salt?

- A) It can dissolve more salt
B) It precipitates all salt instantly
C) Its capacity drops to zero
D) It freezes solid

Q27. Husk and wheat grain mixture: husk is light, grain is heavy. Which technique is ideal?

- A) Handpicking
B) Winnowing
C) Filtration
D) Decantation

Q28. Water obtained after filtration process is called:

- A) Residue
B) Filtrate
C) Solute
D) Sediment

Q29. The solid material remaining on the filter paper after filtration is called:

- A) Filtrate
B) Residue
C) Solution
D) Solvent

Q30. Separating a mixture of salt and sand involves which sequence of procedures?

- A) Dissolving in water -> Filtration -> Evaporation of filtrate
B) Winnowing -> Threshing -> Sieving
C) Handpicking -> Decantation
D) Magnetic pull -> Heating

Answer Key - Chapter 9

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	A	B	B	B	B	B	B	B	B	B	B	A
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	B	B	A	A	B	B	A	A	B	B	B	A

CHAPTER 10: LIVING CREATURES: EXPLORING THEIR CHARACTERISTICS

KEY CONCEPTS & ESSENTIAL KEYWORDS

Living vs Non-living Cellular Structure Nutrition Respiration Excretion Response to Stimuli
Reproduction Growth

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- All living organisms share fundamental defining characteristics: structural cellular organization, nutrition requirement, growth, respiration, excretion, response to environmental stimuli, reproduction, and finite lifespan.
- Cellular Structure: Cells are the fundamental structural and functional units of all life forms.
- Respiration releases energy from ingested food through oxidation. Breathing is the physical gas exchange component of respiration.
- Response to Stimuli: Organisms react to external environmental changes (light, heat, touch, sound). Mimosa pudica (Touch-me-not) leaves fold upon touch.
- Excretion eliminates metabolic waste products (urea, carbon dioxide, sweat) from the body system.
- Reproduction ensures species continuity via sexual or asexual modes.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Which of the following is a universal characteristic shared by ALL living organisms?

- | | |
|--------------------------------------|---------------------------------------|
| A) Ability to perform photosynthesis | B) Cellular structure and respiration |
| C) Presence of green leaves | D) Ability to fly |

Q2. The basic structural and functional unit of all living organisms is the:

- | | |
|-----------|-----------------|
| A) Tissue | B) Cell |
| C) Organ | D) Organ system |

Q3. The process by which living organisms breakdown food inside cells to release energy is:

- | | |
|--------------|----------------|
| A) Breathing | B) Respiration |
| C) Digestion | D) Excretion |

Q4. Plant leaves fold rapidly when touched in Mimosa pudica (Touch-me-not). This demonstrates:

- | | |
|-----------------|---------------------------------|
| A) Excretion | B) Response to external stimuli |
| C) Reproduction | D) Photosynthesis |

Q5. The biological process of eliminating toxic metabolic waste products from an organism's body is:

- | | |
|----------------|-----------------|
| A) Respiration | B) Excretion |
| C) Circulation | D) Reproduction |

Q6. Which process ensures the biological continuation of a species generation after generation?

- | | |
|--------------|-----------------|
| A) Excretion | B) Reproduction |
| C) Nutrition | D) Growth |

Q7. Breathing in human beings involves inhaling air rich in oxygen and exhaling air rich in:

- | | |
|-------------|-------------------|
| A) Nitrogen | B) Carbon Dioxide |
| C) Hydrogen | D) Argon |

Q8. Plants synthesize their food in leaves using sunlight, water, and CO₂ through:

- | | |
|------------------|-------------------|
| A) Respiration | B) Photosynthesis |
| C) Transpiration | D) Germination |

Q9. Earthworms exchange respiratory gases (oxygen and carbon dioxide) through their:

- | | |
|--------------|---------------------|
| A) Lungs | B) Moist, thin skin |
| C) Spiracles | D) Gills |

Q10. Which component acts as a stimulus when a moth flies toward a glowing light bulb?

- | | |
|-------------------|------------------------|
| A) Sound of bulb | B) Light/Heat emission |
| C) Smell of glass | D) Electricity |

Q11. All living organisms show growth, which in biological terms is:

- | | |
|---|---|
| A) Reversible increase in volume | B) Irreversible permanent increase in size and mass |
| C) Temporary swelling due to water absorption | D) Accumulation of surface dust |

Q12. Which of the following organisms reproduces through egg laying (oviparous)?

- | | |
|-------------------|--------|
| A) Human | B) Cow |
| C) Pigeon / Snake | D) Dog |

Q13. Whales and dolphins breathe air through specialized blowholes located on their heads using:

- | | |
|----------|---------------|
| A) Gills | B) Moist skin |
| C) Lungs | D) Fins |

Q14. What is the primary waste gas released by plants during cellular respiration?

- | | |
|-------------|---------------------|
| A) Oxygen | B) Carbon dioxide |
| C) Nitrogen | D) Water vapor only |

Q15. Plants shoot stems grow upwards toward sunlight. This growth response to light is called:

- | | |
|-----------------|------------------|
| A) Geotropism | B) Phototropism |
| C) Hydrotropism | D) Thigmotropism |

Q16. Root growth downward into soil toward gravity is an example of:

- A) Positive Geotropism
- B) Phototropism
- C) Chemotropism
- D) Negative Geotropism

Q17. Single-celled microscopic organisms like Amoeba and Paramecium are classified as:

- A) Multicellular
- B) Unicellular
- C) Non-living
- D) Acellular

Q18. Which of the following is considered a non-living component of an ecosystem?

- A) Bacteria
- B) Sunlight and soil
- C) Oak tree
- D) Earthworm

Q19. During daytime, green plants carry out:

- A) Photosynthesis only
- B) Respiration only
- C) Both Photosynthesis and Respiration
- D) Neither process

Q20. Which organ in human body is primarily responsible for filtering liquid metabolic waste to produce urine?

- A) Heart
- B) Kidneys
- C) Lungs
- D) Stomach

Q21. Microscopic stomata pores present on plant leaf surfaces function primarily in:

- A) Water absorption from soil
- B) Gas exchange for photosynthesis and respiration, plus transpiration
- C) Anchorage to soil
- D) Flower production

Q22. Do seeds inside a dry storage jar show life processes?

- A) No, they are dead forever
- B) Yes, they are in a dormant state and respire slowly
- C) Yes, they carry out active photosynthesis
- D) No, they have no cells

Q23. Which animal gives birth directly to young ones (viviparous)?

- A) Frog
- B) Lizard
- C) Cow / Human
- D) Eagle

Q24. Lifespan refers to:

- A) The period from birth to natural death of an organism
- B) Time taken to eat food
- C) Speed of running
- D) Duration of sleeping in winter

Q25. Which organism undergoes metamorphosis during its life cycle from tadpole to adult?

- A) Butterfly and Frog
- B) Snake
- C) Dog
- D) Hen

Q26. Plant roots grow toward water sources deep in soil. This growth response is termed:

- A) Phototropism
- B) Hydrotropism
- C) Geotropism
- D) Thigmotropism

Q27. Which organelle is known as the powerhouse of the cell where energy is produced during respiration?

- A) Nucleus
- B) Mitochondria
- C) Chloroplast
- D) Cell wall

Q28. Aquatic plants obtain carbon dioxide for photosynthesis from:

- A) Air above water directly
- B) Dissolved carbon dioxide gas in water
- C) Soil minerals only
- D) Sunlight directly

Q29. Which of the following statement is TRUE regarding non-living things?

- A) They require food for energy
- B) They do not undergo cellular respiration or excretion
- C) They respond to stimuli purposefully
- D) They possess DNA and cells

Q30. The green pigment present inside chloroplasts of plant cells responsible for trapping solar light energy is:

- A) Hemoglobin
- B) Chlorophyll
- C) Carotene
- D) Xanthophyll

Answer Key - Chapter 10

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	B	B	B	B	B	B	B	B	C	C	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
A	B	B	C	B	B	B	C	A	A	B	B	B	B	B

CHAPTER 11: NATURE'S TREASURES

KEY CONCEPTS & ESSENTIAL KEYWORDS

Natural Resources Renewable Resources Non-Renewable Resources Fossil Fuels Conservation
Soil Erosion Deforestation Sustainability

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- Natural resources are materials and energy sources provided by nature essential for life and development.
- Renewable Resources: Naturally replenished continuously over short timeframes (e.g., Solar energy, Wind, Water, Forest biomass).
- Non-Renewable Resources: Exhaustible resources present in fixed quantities that take millions of years to form (e.g., Coal, Petroleum, Natural Gas, Minerals).
- Fossil Fuels: Formed from ancient buried plant and animal biomass under intense heat and pressure over geological ages.
- Over-exploitation causes soil erosion, deforestation, habitat destruction, pollution, and climate change.
- Conservation and Sustainable Development ensure balanced resource utilization without compromising future generations.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. Resources obtained directly from nature that support life and human development are known as:

- | | |
|-----------------------|----------------------|
| A) Man-made resources | B) Natural resources |
| C) Synthetic products | D) Artificial energy |

Q2. Which of the following energy sources is classified as inexhaustible/renewable?

- | | |
|-----------------|----------------|
| A) Coal | B) Petroleum |
| C) Solar energy | D) Natural gas |

Q3. Non-renewable natural resources are those that:

- | | |
|--|---|
| A) Are replenished by nature within days | B) Exist in limited quantities and take millions of years to form |
| C) Never get exhausted regardless of consumption | D) Are synthesized in chemical factories |

Q4. Which of the following is a non-renewable fossil fuel?

- | | |
|-------------------------|--------------|
| A) Wind power | B) Petroleum |
| C) Hydroelectric energy | D) Biomass |

Q5. Coal, petroleum, and natural gas are collectively classified as:

- | | |
|------------------|----------------------------|
| A) Bio-fuels | B) Fossil fuels |
| C) Nuclear fuels | D) Inexhaustible resources |

Q6. The top fertile layer of Earth's crust essential for agricultural vegetation growth is:

- A) Bedrock
- B) Topsoil
- C) Subsoil
- D) Gravel

Q7. Removal of topsoil by wind, rain, and flowing water currents is called:

- A) Afforestation
- B) Soil Erosion
- C) Weathering
- D) Salinization

Q8. Large-scale cutting down of trees and forest cover without adequate replanting is termed:

- A) Afforestation
- B) Deforestation
- C) Reforestation
- D) Forest management

Q9. Which practice directly prevents soil erosion on steep mountain hill slopes?

- A) Overgrazing cattle
- B) Terrace farming / Contour bunding
- C) Deforestation
- D) Surface mining

Q10. Planting new trees on a massive scale to restore depleted forest cover is called:

- A) Deforestation
- B) Afforestation / Reforestation
- C) Urbanization
- D) Desertification

Q11. Black gold is a common commercial term used to refer to:

- A) Coal
- B) Petroleum (Crude Oil)
- C) Iron ore
- D) Graphite

Q12. Compressed Natural Gas (CNG) is considered an eco-friendly vehicle fuel because:

- A) It produces zero carbon
- B) It burns cleaner with lower harmful emissions than petrol or diesel
- C) It is cheaper than water
- D) It is inexhaustible

Q13. Which layer of atmosphere absorbs harmful ultraviolet (UV) solar radiation protecting life on Earth?

- A) Troposphere
- B) Stratospheric Ozone Layer
- C) Mesosphere
- D) Thermosphere

Q14. Groundwater table depletion occurs rapidly due to:

- A) Excessive rainwater harvesting
- B) Over-extraction via tubewells and reduced percolation from paved soil
- C) Massive afforestation
- D) Heavy natural snowfall

Q15. Sustainable development means:

- A) Consuming all available resources right now
- B) Balancing resource usage to meet present needs while conserving for future generations
- C) Stopping all industrial development completely
- D) Depending only on non-renewable energy

Q16. Which of the following is a clean, renewable source of energy powered by water dams?

- A) Thermal power
- B) Hydroelectric power
- C) Nuclear power
- D) Diesel generator

Q17. Natural gas is primarily composed of which hydrocarbon gas?

- A) Ethane
- B) Methane (CH₄)
- C) Propane
- D) Butane

Q18. Humus present in fertile topsoil consists of:

- A) Crushed granite rocks
- B) Decayed organic matter from plants and animals
- C) Synthetic chemical fertilizers
- D) Plastic micro-beads

Q19. The practice of crop rotation helps in:

- A) Depleting soil nitrogen
- B) Maintaining soil fertility naturally
- C) Increasing soil erosion
- D) Consuming excessive irrigation water

Q20. Which fossil fuel is known as 'Buried Sunshine'?

- A) Petroleum
- B) Coal
- C) Natural Gas
- D) Uranium

Q21. The process of turning fertile agricultural land into dry desert due to deforestation and overgrazing is:

- A) Salinization
- B) Desertification
- C) Afforestation
- D) Urbanization

Q22. Biogas produced in rural plants from cattle dung and organic waste consists mainly of:

- A) Carbon monoxide
- B) Methane and Carbon dioxide
- C) Pure Oxygen
- D) Nitrogen dioxide

Q23. Which non-metallic mineral resource is widely used in electrical insulation and electronics?

- A) Iron
- B) Mica
- C) Copper
- D) Gold

Q24. Rainwater harvesting directly helps in:

- A) Depleting groundwater tables
- B) Recharging underground aquifers and mitigating local water scarcity
- C) Increasing soil erosion
- D) Causing flash floods

Q25. Which of the following is an inexhaustible natural resource?

- A) Forests
- B) Atmospheric Air / Wind
- C) Minerals
- D) Coal

Q26. Overuse of chemical fertilizers in farming leads to:

- A) Permanent increase in natural humus
- B) Soil acidification, loss of natural fertility, and water pollution
- C) Rapid forest growth
- D) Infinite crop yields

Q27. Wildlife conservation reserves like National Parks and Sanctuaries aim to protect:

- A) Urban factories
- B) Endangered flora, fauna, and natural habitats
- C) Dams and bridges
- D) Agricultural crop fields

Q28. Which fuel is extracted through deep sea drilling wells?

- A) Coal
- B) Petroleum and Natural Gas
- C) Wood
- D) Uranium ore

Q29. The 3 R's rule for environmental protection and resource conservation stands for:

- A) Read, Research, Review
- B) Reduce, Reuse, Recycle
- C) Remove, Replace, Restore
- D) Run, Recover, React

Q30. Solar panels convert solar energy directly into clean:

- A) Thermal energy only
- B) Electrical energy
- C) Chemical fuel
- D) Mechanical motion

Answer Key - Chapter 11

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	C	B	B	B	B	B	B	B	B	B	B	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

CHAPTER 12: BEYOND EARTH

KEY CONCEPTS & ESSENTIAL KEYWORDS

Solar System Planets Stars Constellations Moon Phases Satellites Asteroids Comets Milky Way

CORE STUDY NOTES & SCIENTIFIC PRINCIPLES

- The Universe comprises stars, celestial bodies, galaxies, and vast interstellar space.
- Our Solar System consists of the Sun (central star), 8 major planets, dwarf planets (Pluto), natural satellites (moons), asteroids, meteoroids, and comets.
- Inner Terrestrial Planets (rocky): Mercury, Venus, Earth, Mars. Outer Gas/Ice Giants: Jupiter, Saturn, Uranus, Neptune.
- Moon is Earth's sole natural satellite. Phases of the Moon occur due to relative positions of Sun, Earth, and Moon during lunar revolution (29.5 days).
- Stars generate energy through nuclear fusion. Sun is the closest star to Earth.
- Constellations are recognizable patterns formed by groups of stars in the night sky (e.g., Ursa Major / Saptarshi, Orion).
- Artificial satellites (ISRO's Aryabhata, INSAT, Chandrayaan) orbit Earth for communication, weather forecasting, and astronomical exploration.

STANDARD PRACTICE QUESTIONS (30 MCQS)

Q1. The central, most massive celestial body around which all planets in our solar system orbit is:

- | | |
|-------------|------------|
| A) The Moon | B) The Sun |
| C) Jupiter | D) Polaris |

Q2. Which planet is closest to the Sun in our solar system?

- | | |
|----------|------------|
| A) Venus | B) Mercury |
| C) Earth | D) Mars |

Q3. Which planet is known as the 'Morning Star' or 'Evening Star' due to its intense brightness in sky?

- | | |
|------------|-----------|
| A) Mars | B) Venus |
| C) Jupiter | D) Saturn |

Q4. Red Planet is the popular astronomical nickname given to:

- | | |
|------------|----------|
| A) Mercury | B) Mars |
| C) Jupiter | D) Venus |

Q5. Which is the largest planet in our solar system by diameter and mass?

- | | |
|------------|------------|
| A) Saturn | B) Jupiter |
| C) Neptune | D) Uranus |

Q6. The distinct, beautiful rings surrounding planet Saturn are primarily composed of:

- A) Solid gold and silver
- B) Ice, dust particles, and rocky debris
- C) Glowing hot gas flames
- D) Liquid water oceans

Q7. A recognizable group or pattern formed by stars in the night sky is called a:

- A) Galaxy
- B) Constellation
- C) Nebula
- D) Asteroid belt

Q8. The prominent seven-star constellation known in Indian astronomy as 'Saptarshi' is part of:

- A) Orion
- B) Ursa Major (Great Bear)
- C) Cassiopeia
- D) Scorpius

Q9. The Pole Star (Polaris) always indicates which geographical direction to observers in Northern Hemisphere?

- A) South
- B) North
- C) East
- D) West

Q10. What is the time taken by Earth to complete one full revolution around the Sun?

- A) 24 hours
- B) 365.25 days (1 year)
- C) 30 days
- D) 12 hours

Q11. Phases of the Moon are caused by:

- A) Earth's shadow covering Moon continuously
- B) Changes in the visible illuminated portion of Moon reflecting sunlight as it orbits Earth
- C) Moon changing its actual physical shape
- D) Clouds blocking Moon view

Q12. The night when the Moon is completely invisible from Earth is called:

- A) Full Moon (Purnima)
- B) New Moon (Amavasya)
- C) Crescent Moon
- D) Lunar Eclipse

Q13. Asteroid Belt in our solar system is situated between the orbits of which two planets?

- A) Earth and Mars
- B) Mars and Jupiter
- C) Jupiter and Saturn
- D) Venus and Earth

Q14. Celestial bodies made of ice, dust, and frozen gases that develop a glowing tail when approaching Sun are:

- A) Asteroids
- B) Comets
- C) Meteors
- D) Black holes

Q15. Shooting stars are not actual stars, but small rocky particles burning up in Earth's atmosphere called:

- A) Comets
- B) Meteors
- C) Satellites
- D) Supernovas

Q16. India's first artificial scientific satellite launched into space in 1975 was named:

- A) Bhaskara
- B) Aryabhata
- C) Rohini
- D) Chandrayaan-1

Q17. Which premier Indian space agency is responsible for national space exploration missions like Chandrayaan and Mangalyaan?

- A) NASA
- B) ISRO
- C) ESA
- D) Roscosmos

Q18. Our Solar System is situated inside which spiral galaxy?

- A) Andromeda Galaxy
- B) Milky Way Galaxy (Akash Ganga)
- C) Triangulum Galaxy
- D) Sombrero Galaxy

Q19. Which planet possesses the prominent natural satellite named 'Titan'?

- A) Jupiter
- B) Saturn
- C) Uranus
- D) Mars

Q20. The distance traveled by light in one year in vacuum is used to measure astronomical distances, termed:

- A) Kilometer
- B) Astronomical Unit
- C) Light-year
- D) Parsec

Q21. Why do stars appear to twinkle in the night sky when viewed from Earth?

- A) Stars continuously blink their light output
- B) Atmospheric refraction of starlight through air layers of varying density
- C) Moon passes in front of stars
- D) Stars rotate rapidly

Q22. Which planet orbits the Sun in a retrograde (clockwise, East to West) direction unlike most planets?

- A) Earth
- B) Venus
- C) Mars
- D) Neptune

Q23. Which planet was reclassified as a 'Dwarf Planet' by the International Astronomical Union in 2006?

- A) Neptune
- B) Pluto
- C) Mercury
- D) Uranus

Q24. How many natural satellites (moons) orbit planet Earth?

- A) Zero
- B) One
- C) Two
- D) Four

Q25. Halley's Comet appears in the sky near Earth predictably once every:

- A) 10 years
- B) 76 years
- C) 100 years
- D) 500 years

Q26. Constellation 'Orion' is popularly known as:

- A) The Great Bear
- B) The Hunter (Vyadha)
- C) The Queen
- D) The Lion

Q27. What is the primary energy production process inside the core of the Sun?

- A) Chemical combustion of coal
- B) Nuclear Fusion (conversion of Hydrogen to Helium)
- C) Nuclear Fission of Uranium
- D) Gravitational friction

Q28. Which planet is known as the coldest, windiest outer planet with a striking deep blue color?

- A) Uranus
- B) Neptune
- C) Saturn
- D) Mars

Q29. The time taken by moonlight to reach Earth's surface is approximately:

- A) 8 minutes 20 seconds
- B) 1.3 seconds
- C) 1 hour
- D) 24 hours

Q30. Which artificial satellite system provides weather monitoring, telecommunication, and TV broadcasting in India?

- A) IRS series
- B) INSAT / GSAT series
- C) Astrosat
- D) Cartosat

Answer Key - Chapter 12

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
B	B	B	B	C	B	B	B	B	B	B	B	B	B	B