

## 1. NATURAL RESOURCES

- 1.1 Introduction
- 1.2 Recognize the metallic ores of Karnataka
- 1.3 Explain the byproducts of coal
- 1.4 Suggest the processes/ways of conserving natural resources like water, soil, forest, wildlife and fossil fuels
- 1.5 State the various environmental laws passed to conserve the natural resources
- 1.6 Give reasons for the natural resources

## 2. FOODS

- 2.1 Introduction
- 2.2 Define food
- 2.3 Classify constituents of food, based on their composition
- 2.4 Explain the meaning of “deficiency disorders”
- 2.5 Identify the symptoms of “deficiency disorders”
- 2.6 Realise the importance of food protection and preservation
- 2.7 Explain food adulteration
- 2.8 Conduct tests to detect food adulteration
- 2.9 Recall the different food quality control agencies of our country
- 2.10 Appreciate the role of quality control agencies

## 3. HEAT

- 3.1 Introduction
- 3.2 Identify the effects of heat in everyday life
- 3.3 Know the application of thermal expansion of solids, liquids, and gases
- 3.4 Know application of bimetallic strip in thermostat
- 3.5 Know the relation between coefficient of linear, superficial and cubical expansion
- 3.6 Know the anomalous expansion of water and its consequences
- 3.7 Define specific heat and heat capacity
- 3.8 Illustrate the heat of fusion and latent heat of vaporization.

**4. CLASSIFICATION OF LIVING ORGANISMS**

- 4.1 Introduction
- 4.2 Classify the living organisms into five kingdoms
- 4.3 Explain the structure of bacteria, their way of life and economic importance
- 4.4 Describe the structure of diatoms and their economic importance
- 4.5 Explain the structure, reproduction, and economic importance of yeast
- 4.6 Classify the various invertebrate groups from porifera to echinodermata
- 4.7 State the economic importance of various invertebrate groups

**5. NATURE OF LIGHT**

- 5.1 Introduction
- 5.2 List out the properties of light explained by various theories of light
- 5.3 Reason out for calling electromagnetic waves as transverse waves
- 5.4 Calculate the energy of photon

**6. THE WORLD OF MICROBES**

- 6.1 Introduction
- 6.2 Recognise the various groups of microbes
- 6.3 Appreciate the role of microbes in environment management
- 6.4 Reason the need of microbes in decomposition process
- 6.5 State the importance of microbes in maintaining ecological and biological balance
- 6.6 Relate the role of microbes in carbon and nitrogen cycles
- 6.7 Develop a miniature water treatment plant
- 6.8 Appreciate the role of microbes in food industry
- 6.9 State the meaning of genetic engineering
- 6.10 Appreciate the role of microbes in improving the living conditions of human beings

**7. BIOGEOCHEMICAL CYCLES**

- 7.1 Introduction
- 7.2 Explain the interdependence of plants and animals
- 7.3 Define biogeochemical cycle
- 7.4 Differentiate fixation and recycling
- 7.5 Illustrate reservoir pool and exchange pool
- 7.6 Explain carbon cycle
- 7.7 Describe nitrogen cycle
- 7.8 Schematically represent oxygen cycle

- 7.9 Explain water cycle
- 7.10 Schematically represent different nutrient flow in biological cycles
- 7.11 Differentiate between various biogeochemical cycles
- 7.12 Appreciate the importance of biogeochemical cycles in the nature

## 8. PROPERTIES OF MATTER

- 8.1 Introduction
- 8.2 Identify the properties of the matter
- 8.3 Differentiate between the kinds of matter based on these properties
- 8.4 Reason out for the use of metals in jewellery
- 8.5 Recall the meaning of malleability and ductility of metals
- 8.6 Reason out for the deformation of some objects
- 8.7 Define modulus of elasticity
- 8.8 Understand the significance of Hooke's law

## 9. EXCRETION OF ANIMALS

- 9.1 Introduction
- 9.2 Define excretion
- 9.3 Learn how waste products are generated in our body
- 9.4 Learn the harm caused by such waste products
- 9.5 Appreciate the necessity for excretion
- 9.6 Learn that though the process of excretion is the same, the methods employed are different in different animals
- 9.7 Identify the different types of wastes excreted by animals
- 9.8 Learn the various parts of human excretory system and the role of each part
- 9.9 Explain the various steps involved in urine formation
- 9.10 Learn some common kidney ailments
- 9.11 Realise the importance of the skin as an organ of excretion
- 9.12 Understand the causes for some common disorders of the human excretory system

## 10. LENS

- 10.1 Introduction
- 10.2 Identify the types of lenses
- 10.3 Draw the diagram for the formation of image by a lens
- 10.4 Recognise the position, nature and size of the image formed by a lens
- 10.5 Identify the uses of lenses in day-to-day life

**11. SYNTHETIC MATERIALS**

- 11.1 Introduction
- 11.2 Identify the synthetic materials
- 11.3 Give reason for the manufacturing of synthetic materials
- 11.4 List out the advantages and disadvantages of using plastics
- 11.5 Differentiate between biodegradable and non-biodegradable material
- 11.6 Describe the steps of manufacturing of cement
- 11.7 List out the uses of sodium carbonate, sodium bicarbonate and Plaster of Paris
- 11.8 List out the properties of sodium carbonate and sodium bi carbonate and Plaster of Paris

**12. LIFE PROCESSES**

- 12.1 Introduction
- 12.2 Appreciate the need of transport system
- 12.3 Define transport system
- 12.4 Prepare a microscope slide of cross section of dicot and monocot stem
- 12.5 Identify xylem and phloem tissue in cross section of stem
- 12.6 Recognize the importance of transpiration in conduction of water
- 12.7 Differentiate between transport in amoeba and higher animals
- 12.8 Appreciate the function of human heart

**13. CHEMICALS IN DAILY LIFE**

- 13.1 Introduction
- 13.2 Know the meaning of fertilizer
- 13.3 Classify the different types of fertilizers
- 13.4 List the properties of good fertilizers
- 13.5 List the uses of fertilizers
- 13.6 Reason out for the wide usage of fertilizers
- 13.7 Explain the process of synthesis of ammonia
- 13.8 Explain the process of manufacture of Super phosphate
- 13.9 Describe the judicious way of using fertilizers

**14. CELL DIVISION**

- 14.1 Introduction
- 14.2 Recognise cell division
- 14.3 Appreciate the need for cell division
- 14.4 Distinguish vegetative and reproductive cells
- 14.5 Identify the various stages of mitosis through microscope
- 14.6 Appreciate the need of mitosis
- 14.7 Recognize various stages of meiosis
- 14.8 Appreciate the role of meiosis in sexual reproduction
- 14.9 Differentiate between meiosis I and meiosis II
- 14.10 Differentiate between mitosis and meiosis

**15. REPRODUCTION IN ANIMALS**

- 15.1 Introduction
- 15.2 Define what reproduction is
- 15.3 Learn why living organisms reproduce
- 15.4 Learn about asexual and sexual reproductions
- 15.5 Explain how amoeba reproduces
- 15.6 Differentiate between male and female cockroach
- 15.7 Learn about the male and female reproductive systems of cockroach
- 15.8 Learn about the male and female reproductive systems of human beings
- 15.9 Learn the process and importance of menstrual cycle in human female
- 15.10 Learn about the sad story of female infanticide in India and its possible after effects
- 15.11 Come to know how twins are formed
- 15.12 Acquire knowledge about assisted Reproductive Techniques (ART) such as IVF

**16. OPTICAL INSTRUMENTS**

- 16.1 Introduction
- 16.2 Identify the use of convex lens in day-to-day life
- 16.3 Tabulate the differences between simple microscope and compound microscope
- 16.4 Draw ray diagrams to show the working principle of astronomical telescope and terrestrial telescope
- 16.5 State the uses of optical instruments in Astrophysics, Microbiology and Medical sciences

**17. CIRCULAR MOTION**

- 17.1 Introduction
- 17.2 Identify the type of circular motion
- 17.3 Give reason for circular motion as an accelerated motion
- 17.4 Give examples for centripetal force and centrifugal force
- 17.5 Write expression for centripetal force
- 17.6 Differentiate between centripetal force and centrifugal force
- 17.7 Identify centripetal force and centrifugal force in day to day life

**18. ELECTRONIC CONFIGURATION**

- 18.1 Introduction
- 18.2 Explain the term orbit and orbital of an atom
- 18.3 Identify the types and shapes of orbitals
- 18.4 State the Pauli exclusion principle. Hund's rule and Aufbau principle
- 18.5 Calculate the number of electrons in different shells and subshells
- 18.6 Write the electronic configuration of elements
- 18.7 Know the importance of electronic configuration of an element

**19. CHEMICAL BOND**

- 19.1 Introduction
- 19.2 Define the term chemical bond
- 19.3 Differentiate between Ionic and Covalent bonds
- 19.4 Explain the bond formation in sodium chloride
- 19.5 Recall the meaning of covalent bond, Hydrogen bond, Pi bond, Sigma bond and Metallic bond
- 19.6 List out the properties of compounds based on the chemical bonding
- 19.7 Distinguish between oxidation and reduction reactions

**20. ELECTROMAGNETIC RADIATION**

- 20.1 Introduction
- 20.2 Recall the terms related to wave motion
- 20.3 Recall the term electromagnetic wave
- 20.4 Distinguish between mechanical wave and electromagnetic waves
- 20.5 List out the general properties of electromagnetic waves
- 20.6 List out the seven broad ranges of electromagnetic waves
- 20.7 Explain the method of producing different ranges of electromagnetic waves

- 20.8 Recognize that visible light is a part of electromagnetic radiations
- 20.9 List out the uses of electromagnetic waves

## **21. BASICS OF COMPUTER**

- 21.1 Introduction
- 21.2 Define computer
- 21.3 Identify the parts of the computer
- 21.4 Identify input and output devices
- 21.5 Draw the block diagram of computer
- 21.6 Differentiate between hardware and software of a computer
- 21.7 Differentiate RAM and ROM
- 21.8 Define languages of computer
- 21.9 List out the uses of computer

## **22. GRAVITATION**

- 22.1 Introduction
- 22.2 Identify contact forces in nature
- 22.3 Give examples for action-at-a-distance forces
- 22.4 State Newton's universal law of gravitation
- 22.5 Give reasons for variation in acceleration due to gravity

## **23. PHOTOELECTRIC EFFECT AND LASER**

- 23.1 Introduction
- 23.2 Define photoelectric effect
- 23.3 Explain photoelectric effect
- 23.4 List the uses of photoelectric effect
- 23.5 Explain the dual nature of light
- 23.6 Distinguish between ordinary light and laser
- 23.7 Explain the uses of laser in medical field
- 23.8 Explain the uses of laser in industrial field
- 23.9 Recall the terms used to explain the production of laser
- 23.10 Relate the properties of laser to its uses
- 23.11 Draw diagram of helium-neon laser tub

**24. ELECTRICITY**

- 24.1 Introduction
- 24.2 Distinguish between static electricity and electric current
- 24.3 Give reason for considering electricity as the most convenient form of energy
- 24.4 Define the terms-ampere, potential difference, volt and resistance
- 24.5 State Ohm's law
- 24.6 Identify the applications of Ohm's law in daily life
- 24.7 Draw circuit symbols showing parallel and series connection of resistances
- 24.8 Solve numerical problems on Ohm's law
- 24.9 State the effects of electricity
- 24.10 Illustrate with examples the effects of electricity
- 24.11 Analyze the problems faced during the usage of electricity in daily life
- 24.12 Recognize the safety devices used at home for electrical circuits
- 24.13 State the precautions while using electricity

**25. EVOLUTION OF LIFE**

- 25.1 Introduction
- 25.2 List various evidences supporting evolution
- 25.3 Explain comparative anatomy as an evidence
- 25.4 Give examples of vestigial organs in human beings
- 25.5 Explain embryological evidences
- 25.6 Define fossils
- 25.7 Learn the different types of fossils and their formation
- 25.8 Explain dating of fossils
- 25.9 Appreciate the importance of Archaeopteryx
- 25.10 Explain Peripatus and Dipnoi, the living fossils
- 25.11 Explain importance of prototheria
- 25.12 Appreciate the fossil evidences
- 25.13 Narrate Geological Time Scale



**26. RADIOACTIVITY**

- 26.1 Introduction
- 26.2 Define radioactivity
- 26.3 Name the types of radioactivity
- 26.4 Understand alpha decay, beta decay and gamma decays
- 26.5 Define half life
- 26.6 List the uses of radioisotopes

**27. THE SUN**

- 27.1 Introduction
- 27.2 Explain the main features of the sun
- 27.3 Explain the reason for enormous energy output of the sun
- 27.4 Draw a diagram showing the structure of the sun
- 27.5 Explain the reason for calling the sun as the laboratory for studying the other stars
- 27.6 Guess the possibilities after the sun stops emitting energy
- 27.7 State the Kepler's laws of planetary motion