SECTION A

1. What is the function of a galvanometer in a circuit? 1

AI 2. What is meant by power of a lens? 1

3. Why is photosynthesis considered an endothermic reaction? 1

4. Why most of the carbon compounds are poor conductor of electricity? 1

OR

What is a homologous series of carbon compounds? 1

5. What is meant by traits of an individual?

OR

Name the unit of inheritance. What is its functions? 1

AI 6. Define the principal focus of a concave mirror. 1

7. Why are alloys commonly used in electrical heating devices? Give reason. 1

8. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to

(a) absorb the evolved gas. (b) moisten the gas.

(c) absorb moisture from the gas. (d) absorb Cl ions from the evolved gas. 1

9. Generally, non-metals are not lustrous. Which of the following non-metal is lustrous?

(a) Sulphur (b) Oxygen

(c) Nitrogen (d) Iodine 1

OR

Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same?

(i) Good thermal conductivity

(ii) Good electrical conductivity

(iii) Ductility

(iv) High melting point

(a) (i) and (ii) (b) (i) and (iii)

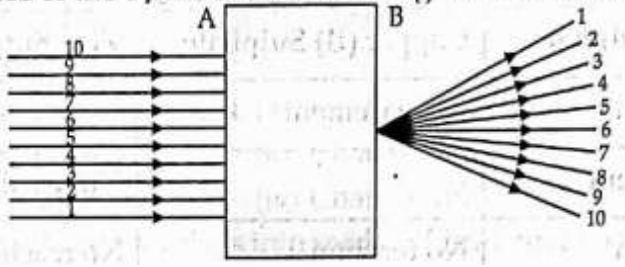
(c) (ii) and (iii) (d) (i) and (iv) 1

10. Elements P, Q, R and S have atomic numbers 11, 15, 17 and 18 respectively. Which of them are reactive non-metals?

(a) P and Q (b) P and R

(c) Q and R (d) R and S 1

11. A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in the figure. Which of the following could be inside the box?



(a) Concave lens

(c) Prism

(b) Rectangular glass slab

(d) Convex lens

OR

Which of the following statements is true ?

(a) A convex lens has 4 dioptre power having a focal length 0.25 m

(b) A convex lens has — 4 dioptre power having a focal length 0.25 m

(c) A concave lens has 4 dioptre power having a focal length 0.25 m

(d) A concave lens has — 4 dioptre power having a focal length 0.25 m 1

12. The bluish colour of water in deep sea is due to ?

(a) the presence of algae and other plants found in water

(b) reflection of sky in water

(c) scattering of light

(d) absorption of light by the sea 1

13. Accumulation of non-biodegradable pesticides in the food chain in increasing amount at each higher trophic level is known as :

(a) Eutrophication (b) pollution

(c) bio-magnification (d) accumulation 1

OR

Organisms which synthesise carbohydrates from inorganic compounds using radiant energy are called :

(a) decomposers (b) producers

(c) herbivores (d) carnivores 1

Directions : For question numbers 14-16, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below :

(a) Both A and R are true and R is correct explanation of the assertion.

(b) Both A and R are true but R is not the correct explanation of the assertion.

(c) A is true but R is false.

(d) A is false but R is true

14. **Assertion (A) :** Refractive index of glass with respect to air is different for red light and violet light.

Reason (R) : Refractive index of a pair of media depends on the wavelength of light used. 1

15. **Assertion (A) :** Ozone is both beneficial and damaging.

Reason (R) : Stop the release of chlorofluorocarbons to protect the ozone. 1

16. **Assertion (A) :** Valves are present in the arteries.

Reason (R) : Arteries carry oxygenated blood from heart to different body parts except pulmonary artery. 1

17. Study the given table and answer the following questions:

A student took the samples of four metals A, B, C and D and added following solution one by one The results obtained have been tabulated as follows:

(a) Which is the most reactive metal ? (i) A (ii) B (iii) C (iv) D

(b) What would you observe if B is added to a solution of Copper (II) Sulphate ?

Metal	Iron (II) Sulphate	Copper (II) Sulphate	Zinc Sulphate	Silver Nitrate
A	No reaction	Displacement	-	-
B	Displacement	-	No reaction	-
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

(c) Arrange the metals A, B, C and D in the order of decreasing reactivity ?

(i) B > A > C > D (ii) D > B > A > C

(iii) C > D > B > A (iv) A > C > D > B

(d) Which gas is produced when dilute HCl is added to a reactive metal ?

(i) CO_2 gas (ii) SO_2 gas

(iii) H_2 gas (iv) N_2 gas

(e) On the basis of sequence of reactions, identify the most and least reactive elements.

$A + BX \rightarrow AX + B$

$C + AY \rightarrow CY + A$

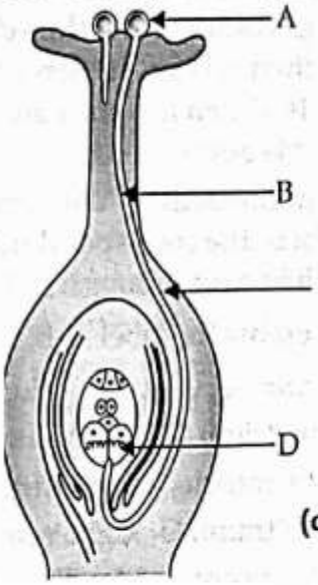
(i) Most reactive: C; Least reactive: B

(ii) Most reactive: B; Least reactive: C

(iii) Most reactive: A; Least reactive : B

(iv) Most reactive : B; Least reactive: A

18. Study the diagram given below and answer the following questions.



(a) Which of these represent the part marked 'A' in the diagram ?

(i) Dust (ii) Germs

(iii) Pollen (iv) Pollinators

(b) How does 'A' reaches part 'B' ?

(c) State the importance of the part 'C' ?

(i) Carries male gamete to reach egg.

(ii) Carries female gamete to reach egg.

(iii) Connect stigma to style

(iv) Helps in pollination

(d) What happens to the part marked 'D' after fertilization is over ?

(i) Changes into embryo (ii) Changes into style

(iii) Changes into stigma (iv) Changes into floral parts.

(e) Which part of the flower develops into seed and fruit after fertilization?

(i) Ovary and ovule respectively (iii) Pistil and stigma respectively

(ii) Ovule and ovary respectively (iv) Pistil and anther respectively

(iv) Pistil and anther respectively

19. Using the given part of the periodic table, answer any four questions given below with reason.

Group → / Period ↓	1	2	13	14	15	16	17	18
3	X		B	C	D	E		
4	Y							
5	Z							

(a) Which of these elements have smallest atomic size?
(i) B (ii) C
(iii) D (iv) E

(b) Write electronic configuration of element E.

(c) Identify the elements which have similar physical and chemical properties as the element Y.

(d) The number of period that the modern periodic table has
(i) Seven (ii) Eight
(iii) Seventeen (iv) Eighteen

(e) An element 'A' belongs to the third period and group 16 of the periodic table. Find out the valency of A?
(i) Valency = 6 (ii) Valency = 2
(iii) Valency = 1 (iv) Valency = 3 4

20. Read the given passage and answer any four questions given below. 4

Oxygen-rich blood from the lungs comes to the thin-walled upper chamber of the heart on the left. The left upper chamber (A) then relaxes. It then contracts and the blood is allowed to enter the next chamber (B), as it expands. When the muscular left lower chamber of heart contracts the blood is pumped out to the body via aorta.

Deoxygenated blood reaches from the body to the upper chamber on the right side of heart (C) and it expands. As this part contracts, the corresponding lower chamber (D) dilates. This transfers the blood to right ventricle, which in turn pumps it to the lungs for oxygenation.

(a) Which of these correctly represents the label A, B, C and D in the above passage?
(i) A- Left atrium, B- Left Ventricle, C- Right atrium, D- Right ventricle
(ii) A- Right ventricle, B- Left atrium, C- Left Ventricle, D- Right atrium
(iii) A- Right atrium, B- Right ventricle, C- Left atrium, D- Left ventricle
(iv) A- Left ventricle, B- Right atrium, C- Right ventricle, D- Left atrium

(b) Which chambers of human heart contain blood?
(i) A and B (ii) A and C
(iii) C and B (iv) C and D

(c) What is the correct route of blood in a human?
(i) A → B → Lungs → C → D (ii) A → B → D → C → Lungs
(iii) C → D → B → A → Lungs (iv) C → D → Lung → A → B

(d) What prevents backflow of blood inside the heart during contraction?
(i) Valves in heart (ii) Thick muscular walls of ventricles
(iii) Thin walls of atria (iv) All of the above

(e) Assertion (A) : Human heart does not allow mixing of oxygen rich blood with carbon dioxide rich blood.

Reason (R) : Human heart has different chambers.

(i) Both A and R are true and R is correct explanation of the assertion.

(ii) Both A and R are true but R is not the correct explanation of the assertion.

(iii) A is true but R is false.

(iv) A is false but R is true.

SECTION-B

21. Give an example in each of the following case to support that :
    (i) Corrosion of some metals is an advantage.
    (ii) Corrosion of a metal is a serious problem. 2

AI 22. "The chromosomal number of the sexually producing parents and their offspring is the same." Justify this statement. 2

OR

Differentiate between dominant and recessive traits. 2

23. An object is placed at a distance of 20 cm in front of convex mirror of radius of curvature 30 cm. Find the position and nature of the image. 2

AI 24. What is meant by the power of a lens ? Give its SI unit. When two or more lenses are placed in contact what will be their combined power ?

25. Define '1 Volt'. State the relation between work, charge and potential difference for an electric circuit. Calculate the potential difference between the two terminals of the battery if 100 joules of work is required to transfer 20 coulombs of charge from one terminal of the battery to the other.

OR

List in a tabular form two differences between a voltmeter and an ammeter.

AI 26. Two lamps one rated 100 W 220 V, and the other 60 W 220 V, are connected in parallel to electric mains supply. Find the currents drawn by two bulbs from the line, if the supply voltage is 220 V. 2

SECTION-C

AI 27. In the reaction :

$MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

(a) Name the compound (i) oxidised, (ii) reduced.

(b) Define oxidation and reduction on its basis. 3

28. 1 g of solid sodium chloride is taken in a clean and dry test tube and 2mL of conc. sulphuric acid is added to it. If the gas evolved is tested first with dry and then with wet blue litmus paper, in which case will the litmus paper change colour ? Give reason for your answer ? What inference can be drawn about the nature of the evolved gas ? Support your answer with chemical equation for the reaction. 3

AI 29. Mention the pathway of urine starting from the organ of its formation. Name four substances which are reabsorbed from the initial filtrate in the tubular part of the nephron ? 3

30. In the context of reproduction of species state the main difference between fission and fragmentation. Also give one example of each.

OR

What is multiple fission ? How does it occur in an organism ? Explain briefly. Name one organism which exhibits this type of reproduction. 3

31. (i) What is visible spectrum ?
(ii) Why is red used as the stopping light at traffic signals ?
(iii) Two triangular glass prisms are kept together connected through their rectangular side. A light beam is passed through one side of the combination. Will there be any dispersion? Justify your answer. 3

32. Explain whether an alpha particle will experience any force in a magnetic field if :
(i) It is placed in the field at rest ?
(ii) It moves in the magnetic field parallel to field lines.
(iii) It moves in the magnetic field perpendicular to field lines. 3

33. While teaching the chapter "Our Environment" the teacher stressed upon the harmful effects of burning of fossil fuels, plastic paper etc. The students noticed the extensive use of plastic and polythene in daily life, which can be avoided and the surroundings can be kept clean. They decided to make their school "Plastic and Polythene" free and motivated each other for its minimum use.
(a) Why should the use of polythene and plastic be reduced in daily life ?
(b) In what way the students would have avoided the use of plastic and polythene in their school ?
(c) How the students would have motivated each other for the success of their decision. 3

SECTION-D

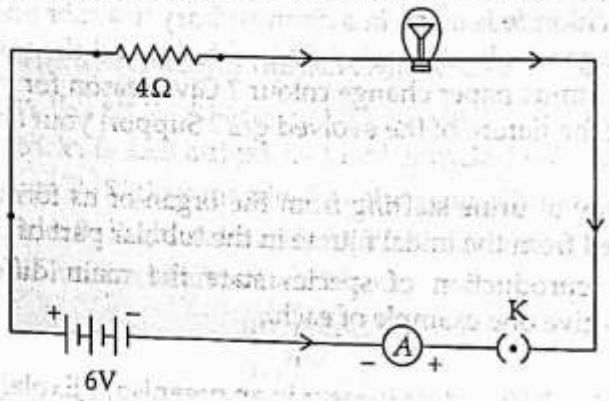
34. (a) The modern periodic table has been evolved through the early attempts of Dobereiner, Newland and Mendeleev. List one advantage and one limitation of all the three attempts.
(b) Name the scientist who first of all showed that atomic number of an element is a more fundamental property than its atomic mass ? 5

35. (a) Name the organ that produces sperms as well as secretes a hormone in human males. Name the hormone it secretes and write its functions ?
(b) Name the parts of the human female reproductive system where fertilisation occurs ?
(c) Explain how the embryo gets nourishment inside the mother's body. 5

OR

What is vegetative propagation ? List with brief explanation three advantages of practising this process for growing same types of plants. Select two plants from the following which are grown by this process :
Banana, Wheat, Mustard, Jasmine, Gram. 5

36. An electric lamp of resistance 20 Ω and a conductor of resistance 4 Ω are connected to a 6 V battery as shown in the circuit. Calculate :
(a) the total resistance of the circuit.
(b) the current through the circuit
(c) the potential difference across the
(i) electric lamp and (ii) conductor, and
(d) power of the lamp. 5



OR

(i) Derive an expression for Joule's law of heating ?
(ii) Give two examples for applications of heating effect of electric current ?
(iii) 100 J of heat is produced each second in a 4 Ω resistor. Find the potential difference across the resistor.