

COIMBATORE SAHODAYA COMPLEX

SCIENCE (086) 2024-25

SET B

CLASS: X

Total Marks: 80

Duration 3Hours

General Instructions:

1. All questions would be compulsory. However, an internal choice of approximately 33% would be provided. 50% marks are to be allotted to competency-based questions.
2. Section A would have 16 simple/complex MCQs and 04 Assertion-Reasoning type questions carrying 1 mark each.
3. Section B would have 6 Short Answer (SA) type questions carrying 02 marks each.
4. Section C would have 7 Short Answer (SA) type questions carrying 03 marks each.
5. Section D would have 3 Long Answer (LA) type questions carrying 05 marks each.
6. Section E would have 3 source based/case based/passage based/integrated units of assessment (04 marks each) with sub-parts of the values of 1/2/3 marks

SECTION A

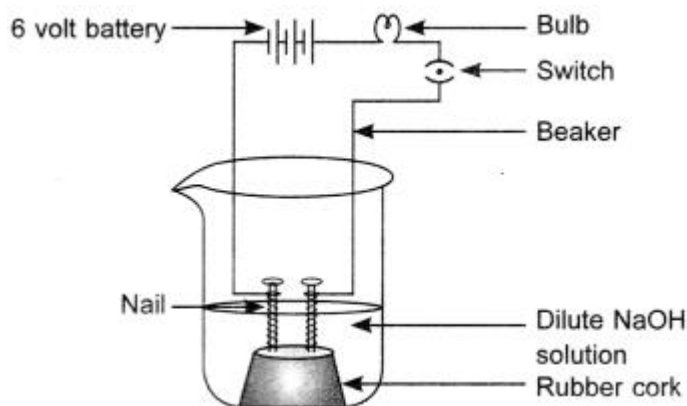
(20×1=20M)

1. Dilute hydrochloric acid is added to granulated zinc taken in a test tube. The following observations are recorded. Point out the correct observation.
 - (a) The surface of metal becomes shining
 - (b) The reaction mixture turns milky
 - (c) Odour of a pungent smelling gas is recorded
 - (d) A colourless and odourless gas is evolved 1
2. Which one of the given properties is not generally exhibited by ionic compounds?

(a) Solubility in water	(b) Electrical conductivity in solid state	
(c) High melting and boiling points	(d) Electrical conductivity in molten state	1
3. Which one of the following salts does not contain water of crystallisation?

(a) Blue vitriol ----	(b) Baking soda	
(c) Washing soda---	(d) Gypsum	1

4. The apparatus given in the adjoining figure was set up to demonstrate electrical conductivity.



Which of the following statement(s) is (are) correct?

- (i) Bulb will not glow because electrolyte is not acidic.
- (ii) Bulb will glow because HCl is a strong acid and furnishes ions for conduction.
- (iii) Bulb will not glow because circuit is incomplete.
- (iv) Bulb will not glow because it depends upon the type of electrolytic solution.

(a) (i) and (iii)

(b) (ii) and (iv)

(c) (ii) only

(d) (iv) only

1

5. A substance 'X' is used in white-washing and is obtained by heating limestone in the absence of air. Identify 'X'.

- (a) CaOCl_2 (b) $\text{Ca}(\text{OH})_2$ (c) CaO (d) CaCO_3

1

6. Which one among the following is an acidic oxide?

- (a) Na_2O (b) CO (c) CO_2 (d) Al_2O_3

1

7. Which of the following are correctly matched in the given table?

1.	Dissolution	Solute gets dissolved in a solvent.
2.	Exothermic	Heat is absorbed.
3.	Reversible change	Reactants can be obtained.

(a) 1 and 2

(b) 2 and 3

(c) 1 and 3

(d) 1, 2 and 3

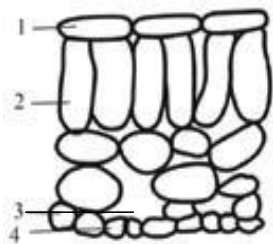
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8. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?

- (a) Starch breaking down into sugars.
- (b) Proteins breaking down into amino acids.
- (c) Absorption of vitamins.
- (d) Fats breaking down into fatty acids and glycerol.

9. The diagram shows the arrangement of cells inside the leaf of a green plant. (No cell

contents are shown). Which cells normally contain chloroplasts?

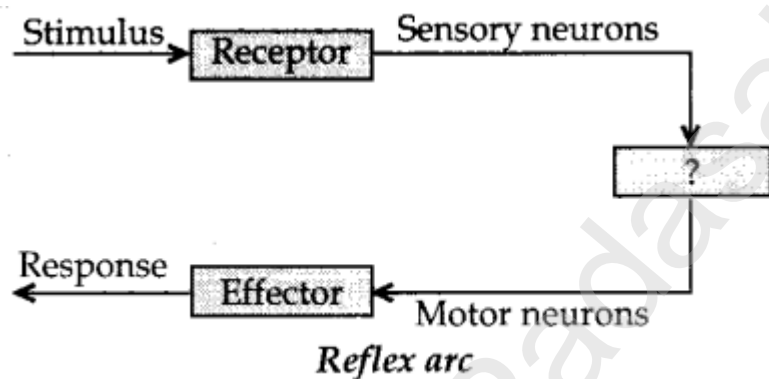


- (a) 1 and 4 (b) 1 and 2 (c) 2 and 4 (d) 2 and 3 1

10. In which group of the organisms the food material is broken down outside the body?

- (a) Mushroom, green plants, amoeba (b) Yeast, mushroom, bread mould
 (c) Paramecium, amoeba, cuscuta (d) Cuscuta, lice, tapeworm 1

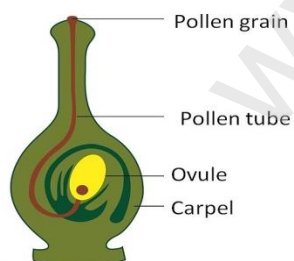
11.



Give the missing term.

- (a) Spinal cord (b) Brain (c) Cranial nerves (d) Hypothalamus 1

12. Identify the tropism shown in the diagram below.



- (a) Geotropism (b) Hydrotropism
 (c) Phototropism (d) Chemotropism 1

13. The power of a concave lens of focal length 10 cm is:

- (a) -10 dioptre (b) +10 dioptre (c) -0.1 dioptre (d) +0.1 dioptre 1
14. Red colour is used as danger sign as
 (a) red colour scattered least by smoke (c) red colour scattered most by smoke
 (b) Red colour absorbs by the smoke (d) red colour moves fast in air 1
15. In a given food chain if the amount of energy at the fourth trophic level is 6 kJ, what will be the energy available at the producer level?
 (a) 6000 kJ (b) 20 kJ (c) 60 kJ (d) 600 kJ 1
16. In an ecosystem, the 10% of energy available for transfer from one trophic level to the next is in the form of:
 (a) heat energy (b) light energy (c) chemical energy (d) mechanical energy 1

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true but R is not the correct explanation of A.
 (c) A is true but R is false.
 (d) A is false but R is true.

17. **Assertion (A):** A lead nitrate on thermal decomposition gives lead oxide, brown coloured nitrogen dioxide and oxygen gas.

Reason (R): Lead nitrate reacts with potassium iodide to form yellow ppt. of lead iodide and the reaction is double displacement as well as precipitation reaction. 1

18. **Assertion(A) :** The offspring produced by sexual reproduction is likely to adjust better in environmental fluctuation.

Reason (R) : During the fusion of gametes there is mixing of genetic material from Two parents 1

19. **Assertion (A):** The power of a concave lens is always negative.

Reason (R): Concave lenses diverge light rays. 1

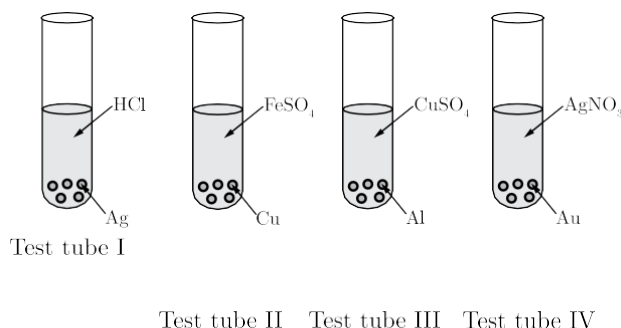
20. **Assertion (A):** Decomposers act as cleaning agents of the environment.

Reason (R): The decomposers recycle waste material in the hydrosphere. 1

SECTION B

(6X2=12 M)

21. A student performs the following four experiments.



Based on the above experiments:

- (i) In which test tube(s) no reaction occurred? Give reason. 2
- (ii) Arrange the given metal samples in the increasing order of reactivity. 2

22. What is feedback mechanism of hormone regulation? Take the example of insulin to explain this phenomenon. 2

23. (a) Name two protein digesting enzymes of human alimentary canal.

(b) What is the role of bile in digestion? 2

OR

(a) Define translocation.

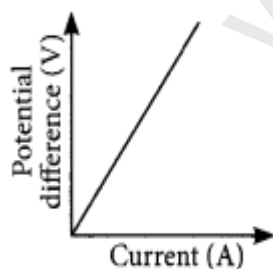
(b) Why ventricles have thicker walls than atria? 2

24. Draw a ray diagram to show the formation of an image by a concave mirror when an object is placed at the focus. 2

25. A bulb is rated at 5.0 V, 100 mA. Calculate its (a) power and (b) resistance. 2

OR

V-I graph for a conductor is as shown in the figure



(i) What do you infer from this graph?

(ii) State the law expressed here. 2

26. Aquarium need to be cleaned once in a while whereas ponds or lakes do not require

any cleaning: Explain 2

SECTION C

(7X3=21M)

27. Sugandha prepares HCl gas in her school laboratory using certain chemicals. She puts both dry and wet blue litmus papers in contact with the gas.

- (i) Name the reagents used by Sugandha to prepare HCl gas.
- (ii) State the colour changes observed with the dry and wet blue litmus papers.
- (iii) Show the formation of ions when HCl gas combines with water. 3

28. State the reason why carbon can neither form C^{4+} cations nor C^{4-} anions, but forms covalent bonds. Also state reasons to explain why covalent compounds

- (i) are bad conductors of electricity
- (ii) have low melting and boiling points. 3

29. (a) What are the features of human lungs to act as an efficient respiratory surface?

(b) What is the difference in transport of oxygen and carbon dioxide in our lungs? 3

30. (a) Mendel crossed Round seed pea plants with Wrinkled seed pea plants in his experiment.

Write his observations giving reasons on the F_1 and F_2 generations.

(b) List any two contrasting characters other than height that Mendel used in his experiments in pea plants 3

31. A person may suffer from both myopia and hypermetropia defects.

- (a) What is this condition called?
- (b) When does it happen?
- (c) Name the type of lens often required by the persons suffering from this defect. Draw labelled diagram of such lenses. 3

32. A nichrome wire has a resistance of 10Ω . Find the resistance of another nichrome wire, whose length is three times and area of cross-section four times the first wire. 3

33. What is solenoid? Draw the pattern of magnetic field lines of

- (i) a current carrying solenoid and
- (ii) a bar magnet.

List two distinguishing features between the two fields. 3

SECTION D

(3X5=15M)

34. Why is homologous series of carbon compounds so called? Write the chemical formula of two consecutive members of any homologous series and state the part of these compounds that determines their (i) physical and (ii) chemical properties. 5

OR

What are covalent compounds? Why are they different from ionic compounds? List their three characteristic properties. 5

35. (a) Draw diagram of female reproductive system and label the parts

(b) What is the function of placenta?

(c) What happens if there is no fertilization? 5

OR

(a) What is the importance of vegetative propagation in plants?

(b) Draw and explain the mode of reproduction in rhizopus. 5

36. Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2 V each, a combination of three resistors of 10 Ω , 20 Ω and 30 Ω connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following:

(a) Current through each resistor

(b) Total current in the circuit

(c) Total effective resistance of the circuit. 5

OR

Draw a circuit diagram for a circuit consisting of a battery of five cells of 2 volts each, a 5 Ω resistor, a 10 Ω resistor and a 15 Ω resistor, an ammeter and a plug key, all connected in series. Also connect a voltmeter to record the potential difference across the 15 Ω resistor and calculate

(i) the electric current passing through the above circuit and

(ii) potential difference across 5 Ω resistor when the key is closed. 5

SECTION E

(3X4=12M)

37. **Read the following and answer the questions:**

A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions

in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

(i) The massive force that pushes the rocket forward through space is generated due to the

- (a) combination reaction (b) decomposition reaction
(c) displacement reaction (d) double displacement reaction

(ii) A white salt on heating decomposes to give brown fumes and yellow residue is left behind.

The yellow residue left is of

- (a) lead nitrate (b) nitrogen oxide (c) lead oxide (d) oxygen gas

(iii) Which of the following reactions represents a combination reaction?

- (a) $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca (OH)}_2 \text{ (aq)}$
(b) $\text{CaCO}_3 \text{ (s)} \rightarrow \text{CaO (s)} + \text{CO}_2 \text{ (g)}$
(c) $\text{Zn (s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{Cu (s)}$
(d) $2\text{FeSO}_4 \text{ (s)} \rightarrow \text{Fe}_2\text{O}_3 \text{ (s)} + \text{SO}_2 \text{ (g)} + \text{SO}_3 \text{ (g)}$

(iv) Complete the following statements by choosing correct type of reaction for X and Y.

Statement 1: The heating of lead nitrate is an example of 'X' reaction.

Statement 2: The burning of magnesium is an example of 'Y' reaction.

- (a) X-Combination, Y-Decomposition (b) X-Decomposition, Y-Combination
(c) X-Combination, Y-Displacement (d) X- Displacement, Y-Decomposition

4

OR

Read the following and answer the questions :

A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

1. The chemical reaction in which a single substance breaks down into two or more simpler substances upon heating is known as

- (a) thermal decomposition reaction (b) photo decomposition reaction
(c) electric decomposition reaction (d) both (a) and (c)

2. The massive force that pushes the rocket forward through space is generated due to the

- (a) combination reaction (b) decomposition reaction

(c) displacement reaction

(d) double displacement reaction

3. A white salt on heating decomposes to give brown fumes and yellow residue is left behind.

The yellow residue left is of

(a) lead nitrate

(b) nitrogen oxide

(c) lead oxide

(d) oxygen gas

4. Which of the following reactions represents a combination reaction?

(a) $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$

(b) $\text{CaCO}_3 \text{ (s)} \rightarrow \text{CaO (s)} + \text{CO}_2 \text{ (g)}$

(c) $\text{Zn(s)} + \text{CuSO}_4 \text{ (aq)} \rightarrow \text{ZnSO}_4 \text{ (aq)} + \text{Cu(s)}$

(d) $2\text{FeSO}_4 \text{ (s)} \rightarrow \text{Fe}_2\text{O}_3 \text{ (s)} + \text{SO}_2 \text{ (g)} + \text{SO}_3 \text{ (g)}$ 4

38. A teenager experiences rapid growth, increased metabolism, and development of secondary sexual characteristics. These changes are controlled by specific hormones released by the endocrine glands.

1. Which gland is often referred to as the "master gland" because it regulates other glands?

(a) Thyroid gland

(b) Pituitary gland

(c) Adrenal gland

(d) Pancreas

2. The hormone responsible for the growth spurt during puberty is:

(a) Insulin

(b) Growth hormone

(c) Thyroxine

(d) Adrenaline

3. Which hormone is mainly responsible for the development of secondary sexual characteristics in boys?

(a) Estrogen

(b) Progesterone

(c) Testosterone

(d) Insulin

4. Increased secretion of thyroxine from the thyroid gland would most likely result in:

(a) Decreased metabolism

(b) Increased metabolism

(c) Higher blood sugar levels

(d) Lower blood pressure

4

OR

A plant grows towards sunlight and shows responses to gravity and touch. These movements are controlled by plant hormones.

1. The hormone that promotes cell elongation in response to light is:

(a) Cytokinin

(b) Gibberellin

(c) Auxin

(d) Ethylene

2. When a plant grows toward a light source, the process is known as:

(a) Geotropism

(b) Thigmotropism

(c) Hydrotropism

(d) Phototropism

3. Roots growing downwards in response to gravity is an example of:

(a) Positive geotropism

(b) Negative geotropism

(c) Positive phototropism

(d) Negative phototropism

4. The plant hormone responsible for fruit ripening is:

(a) Gibberellin

(b) Cytokinin

(c) Auxin

(d) Ethylene

4

39 . Light is a form of energy which induces sensation of vision to our eyes. It becomes visible when it bounces off on surfaces and hits our eyes. The phenomenon of bouncing back of light rays in the same medium on striking a smooth surface is called reflection of light.

If parallel beam of incident rays remains parallel even after reflection and goes only in one direction is known as regular reflection. It takes place mostly in plane mirrors or highly polished metal surfaces. The mirror outside the driver side of a vehicle is usually a spherical mirror and printed on such a mirror is usually the warning "vehicles in this mirror are closer than they appear."

1. Which type of mirror is used outside the driver's side of a vehicle?

(a) Plane mirror

(b) Concave mirror

(c) Convex mirror

(d) Magic mirror

2. No matter how far you stand from a mirror, your image appears erect. The mirror can be

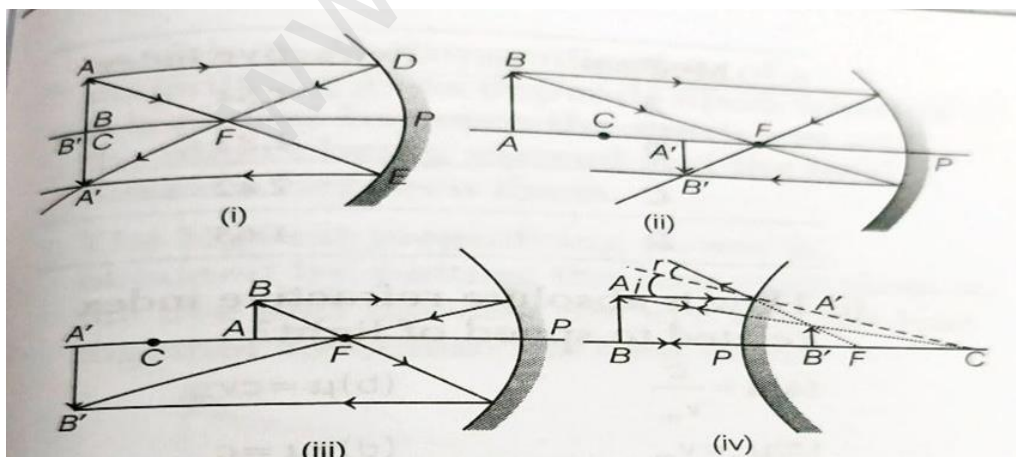
(a) Plane

(b) Concave

(c) convex

(d) Either plane or convex

3. Which of the following diagrams represents the image formation in above case?



- (a) (i) (b) (ii) (c) (iii) (d) (iv)

4. If an object is placed at 10 cm from a convex mirror of radius of curvature 60 cm, then find the position of image.

- (a) 4 cm (b) 7.5 cm (c) 10 cm (d) 12.5 cm 4

OR

When a ray of light incident on a prism it will split in seven colours that is called dispersion of light. A prism is a transparent refracting body bounded by plane faces which are inclined to each other at a particular angle called angle of prism denoted by A . When a ray of light passes through a prism, it suffers refraction twice and hence the ray deviates through a certain angle from its original path. The angle between the incident ray and emergent ray is called angle of deviation.

1. For which colour the angle of deviation is minimum?

- (a). Red (b). Blue (c). Violet (d). Yellow

2. When a white light falls on a prism, the ray at its surface suffers:

- (a) Refraction only (b) dispersion only
(c) deviation only (d) all of above

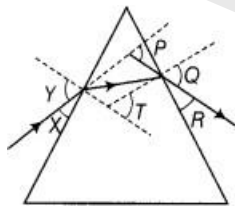
3. In nature, dispersion of light is happening in

- (a) Blue colour of sky (b) Formation of rainbow
(c) Twinkling of stars (d) advance sunrise

4. The cause of dispersion of light is –

- (a) All colours of light travel with the speed more than the speed of light
(b) All colours have different angle of deviation
(c) All the colours of light do not travel with same speed
(d) All the colours have same wavelength

Q 20. The following diagram, the path of a ray of light passing through a glass prism is shown below.



In this diagram, the angle of incidence, the angle of emergence and the angle of deviation respectively, are

(a) X, R and T

(b) Y, Q and T

(c) X, Q and P

(d) Y, Q and P

4

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