

**ST. MARTIN'S DIOCESAN SCHOOL
DELHI CANTT.
MID-TERM EXAMINATION (2025-2026)
CLASS: X
SUBJECT: SCIENCE (086)
SET-II**

DURATION: 03 HRS

M.M: 80

General Instructions:

Read the following instructions very carefully and strictly follow them:

- (i) This Question paper comprises of 39 questions. All questions are compulsory.
- (ii) This Question paper is divided into five sections – A, B, C, D and E.
- (iii) Section A-Question Nos. 1 to 20 are Multiple Choice Questions. Each question carries 1 mark.
- (iv) Section B -Question Nos. 21 to 26 are Very Short Answer type questions. Each question carries 2 marks. Answer to these questions should be in the range of 30 to 50 words.
- (v) Section C - Question Nos. 27 to 33 are Short Answer (SA) type questions. Each question carries 3 marks. Answer to these questions should be in the range of 50 to 80 words.
- (vi) Section D – Question Nos. 34 to 36 are Long Answer type questions. Each question carries 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vii) Section E – Question Nos. 37 to 39 are of 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
- (viii) There is no overall choice. However, an internal choice has been provided in some sections. Only one of the alternatives has to be attempted in such questions.

SECTION-A		
Question 1 to 16 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.		
1	The electrolytic decomposition of water gives H_2 and O_2 in the ratio of A. 1 : 2 by volume B. 2 : 1 by volume C. 8 : 1 by mass D. 1 : 2 by mass	1
2	Fatty foods become rancid due to the process of A. Oxidation B. Corrosion C. Reduction D. Hydrogenation	1

3	<p>Silver article turns black when kept in the open for a few days due to formation of</p> <p>A. H_2S B. AgS C. $AgSO_4$ D. Ag_2S</p>	1
4	<p>When a magnesium ribbon is burnt in air, the ash formed is</p> <p>A. Black B. White C. Yellow D. Pink</p>	1
5	<p>Which one of the following salts does not contain water of crystallisation?</p> <p>A. Blue vitriol B. Baking soda C. Washing soda D. Gypsum</p>	1
6	<p>What is formed when zinc reacts with sodium hydroxide?</p> <p>A. Zinc hydroxide and sodium B. Sodium zincate and hydrogen gas C. Sodium zinc-oxide and hydrogen gas D. Sodium zincate and water</p>	1
7	<p>$Na_2CO_3 \cdot 10H_2O$ is</p> <p>A. Washing soda B. Baking soda C. Bleaching powder D. Tartaric acid</p>	1
8	<p>If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?</p> <p>A. Proteins breaking down into amino acids B. Starch breaking down into sugars C. Fats breaking down into fatty acids and glycerol D. Absorption of vitamins</p>	1
9	<p>Raj noticed that a potted plant kept in the window of his room shows bending towards sunlight. This could be due to:</p> <p>A. More growth in the well lit region due to diffusion of auxin hormone. B. More growth in the region away from light due to diffusion of auxin hormone. C. More growth in the well lit region due to diffusion of cytokinin hormone. D. More growth in the region away from light due to diffusion of cytokinin hormone.</p>	1

10	During exhalation, the exchange of gases takes place between A. Alveoli of the lungs and blood. B. Alveoli of lungs and tissue fluid. C. Blood and body tissues D. Tissue fluid and blood capillaries	1
11	During transpiration, water is lost in the form of water vapour through A. Xylem B. Phloem C. Stomata D. Root hair	1
12	In which of the following groups of organisms, food material is broken down outside the body and then absorbed in? A. mushroom, green plants, amoeba B. yeast, mushroom, bread mould C. paramecium, amoeba, cuscutea D. cuscutea, lice, tapeworm	1
13	For a real object, which of the following can produce a real image? A. Plane mirror B. Concave mirror C. Concave lens D. Convex mirror	1
14	Magnifying power of a concave lens is A. always > 1 B. always < 1 C. always $= 1$ D. can have any value	1
15	Which option correctly shows the order of events when a bright light is focused on our eyes? A. Bright light \rightarrow receptors in eyes \rightarrow sensory neuron \rightarrow spinal cord \rightarrow motor neurons \rightarrow eyelid closes. B. Bright light \rightarrow receptors in eyes \rightarrow spinal cord \rightarrow sensory neuron \rightarrow motor neurons \rightarrow eyelid closes. C. Bright light \rightarrow receptors in eyes \rightarrow sensory neuron \rightarrow motor neurons \rightarrow spinal cord \rightarrow eyelid closes. D. Bright light \rightarrow receptors in eyes \rightarrow spinal cord \rightarrow motor neurons \rightarrow sensory neuron \rightarrow eyelid closes.	1
16	The lining of the alimentary canal has certain muscles that contract rhythmically in order to push the food forward. This process is called: A. Translocation B. Transpiration C. Peristalsis D. Autotrophism	1

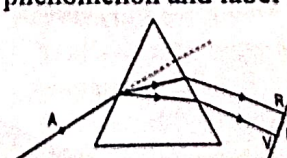
Question No. 17 to 20 consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, and 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) : The acid must always be added to water with constant stirring. Reason (R) : Mixing of an acid with water decreases the concentration of H^+ ions per unit volume.	1
18	Assertion (A): Capillaries have walls that are just one cell thick. Reason (R): Exchange of material between the blood and surrounding cells takes place across the capillaries.	1
19	Assertion (A) : The centre of curvature is not a part of the mirror. It lies outside its reflecting surface. Reason (R): The reflecting surface of a spherical mirror forms a part of a sphere. This sphere has a centre.	1
20	Assertion (A): Coordination in plants is fast and immediate. Reason (R): Plants use chemical means for coordination.	1

SECTION-B

Question No. 21 to 26 are very short answer questions

21	What is the difference between displacement and double displacement reactions? Write equations for their reactions.	2
22	What is the purpose of making urine in the human body? Name the organs that stores and releases the urine.	2
23	<u>Attempt either option A or B.</u> A. A plant X was enclosed in a glass jar with some lizards. A similar plant Y was enclosed in another glass jar but without lizards. Both the jars are kept under the same light conditions for a few hours. Which plant is likely to photosynthesize more and why? OR B. Oxygen, mostly, is carried by a pigment in our blood whereas carbon dioxide is transported in dissolved form in our blood. Give two reasons that make the above statement correct.	2
24	What phenomenon is depicted in the given diagram. Explain the phenomenon and label A and B in the diagram. 	2

25	<p><u>Attempt either option A or B.</u></p> <p>A. What is meant by power of accommodation of the eye? What is the far point and near point of the human eye with normal vision</p> <p>OR</p> <p>B. A convex mirror used for rear-view on an automobile has a radius of curvature of 3.00 m. If a bus is located at 5.00 m from this mirror, find the position, nature and size of the image.</p>	2
✓ 26	What is the difference between the manner in which movement takes place in a sensitive plant and the movement in our legs?	2

SECTION-C

Question No. 27 to 33 are short answer questions

✓ 27	<p>Write a balanced chemical equation with state symbols for the following reactions :</p> <p>(i) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.</p> <p>(ii) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.</p>	3
✓ 28	<p><u>Attempt either option A or B.</u></p> <p>A. State in brief the preparation of washing soda from baking soda. Write balanced chemical equation of the reaction involved.</p> <p>B. What is the colour of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ crystals? How does this colour change upon heating? Give balanced chemical equation for the changes.</p>	3
✓ 29	<p>(i). Given below are some disorders noticed in some patients. It could be due to malfunctioning of which part of brain:</p> <p>(a) Loss of sensation of feeling full</p> <p>(b) Lowered ability to salivate</p> <p>(ii). What is the difference between a reflex action and walking?</p>	3
30	<p>Two major forces help in the transport of water in a plant. Force A is the driving force in the movement of water during the day, whereas force B helps the movement of water in a plant during the night or during the day when humidity is very high.</p> <p>(i) Identify force A and force B.</p> <p>(ii) Describe how each of these forces helps in the movement of water in a plant.</p>	3
✓ 31	Make a diagram to show how hypermetropia is corrected. The near point of a hypermetropic eye is 1 m. What is the power of the lens required to correct this defect? Assume that the near point of the normal eye is 25 cm	3
✓ 32	Describe the formation of rainbow in the sky with the help of a Diagram.	3

33	A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image. Also find its magnification	3
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SECTION-D

Question No. 34 to 36 are long answer questions.

34	<p><u>Attempt either option A or B.</u></p> <p>A. A student dropped few pieces of marble in dilute hydrochloric acid contained in a test tube. The evolved gas was then passed through lime water. What change would be observed in lime water? Write balanced chemical equation for both the change observed?</p> <p>B. (i) Write three equations for decomposition reaction where energy is supplied in the form of heat, light and electricity? (ii) When you mix solutions of lead (II) nitrate and potassium iodide, what is the colour of the precipitate formed? Name the compound evolved?</p>	5
35	<p><u>Attempt either option A or B.</u></p> <p>A. (a) How does blood sugar level get regulated in the human body? (b) (i) Which hormone is secreted into the blood when you are under stress? Name the gland that secretes this hormone. (ii) How does it help the body to cope up in an emergency situation?</p> <p style="text-align: center;">OR</p> <p>B. Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.</p>	5
36	<p><u>Attempt either option A or B.</u></p> <p>A. (i) Why do stars twinkle and planets do not twinkle? (ii) Why does the sky appear dark instead of blue to an astronaut?</p> <p style="text-align: center;">OR</p> <p>B. A person needs a lens of power -5.5 dioptres for correcting his distant vision. For correcting his near vision he needs a lens of power $+1.5$ dioptre. What is the focal length of the lens required for correcting (i) distant vision, and (ii) near vision?</p>	5

SECTION-E

Question No. 37 to 39 are case-based/data-based questions.

37	<p><u>Attempt either subpart B or C.</u></p> <p>Corrosion is the phenomenon of deterioration of surface of metal in presence of air and moisture. It is a natural process and in the presence of a moist atmosphere, chemically active metals get corroded. This is an oxidation reaction. Rusting is the process where iron corrodes due</p>	4
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to exposure to the atmosphere. The main circumstance of corrosion occurs with iron because it is a structural material in construction, bridges, buildings, rail transport, ships, etc. Aluminium is also an important structural metal, but even aluminium undergoes oxidation reactions. However, aluminium doesn't corrode or oxidize as rapidly as its reactivity suggests. Copper (Cu) corrodes and forms a basic green carbonate.

Answer the following:

- A. Explain the process of rusting?
- B. Which two metals do not corrode easily?

OR

- C. Write the chemical name and formula of the compound formed on corrosion of silver.

38

Attempt either subpart A or B.

In the school garden, students observed a pea plant growing near a fence. Over time, they noticed that the tendrils of the pea plant curled around the wire mesh. The tendrils appeared to grow towards the support and wrapped tightly around it, helping the plant climb.

- A. Name the type of plant movement exhibited by the tendrils of the pea plant in this case? What is the stimulus responsible for this movement?

OR

- B. Explain how this movement is different from nastic movement.
- C. How does the hormone promote the growth of a tendril around a support?

4

39

Attempt either subpart C or D.

Light scattered by fine particles whose size is comparable to the wavelength of light. This can be demonstrated by a simple experiment.

A few drops of sulphuric acid are added to a glass tank containing sodium thiosulphate solution. An intense beam of white light is passed through the tank and the emergent beam allowed to fall on a screen. Due to the action of the acid, Sulphur is precipitated in the form of tiny particles. The emergent beam is found to be orange – red in colour, indicating that the blue and violet colour are removed from white light by scattering.

A The danger signals installed at the top of tall buildings are red in colour. These can be easily seen from a distance because among all other colours, the red light

- a) is scattered the most by smoke or fog
- b) is scattered the least by smoke or fog
- c) is absorbed the most by smoke or fog
- d) moves fastest in air

4

B The clear sky appears blue because

- a) blue light gets absorbed in the atmosphere
- b) ultraviolet radiations are absorbed in the atmosphere
- c) violet and blue lights gets scattered more than the lights of other colours by the atmosphere
- d) lights of all other colours is scattered more than the violet and blue colour lights by the atmosphere.

C. What is the relationship between scattering of light and wavelength?

OR

D. Why does sky appear blue in colour?

Sanjeer



ARMY PUBLIC SCHOOL DHAULA KUAN
MULTIPLE CHOICE QUESTION BANK

CLASS : X

SUBJECT: SCIENCE (CHEMISTRY)

CHAPTER 1 - CHEMICAL REACTIONS AND EQUATIONS

Q1	When 50g of lead powder is added to 300 ml of blue copper sulphate solution, after a few hours, the solution becomes colourless. This is an example of (a) Combination reaction (b) Decomposition reaction (c) Displacement reaction ✓ (d) Double displacement reaction
Q2	What type of reaction occurs when magnesium reacts with oxygen to form magnesium oxide? (a) Combination ✓ (b) Decomposition (c) Displacement (d) Double displacement
Q3	In a chemical equation, the total number of atoms on the reactant side is always: (a) Less than on the product side (b) Greater than on the product side. (c) Equal to the product side ✓ (d) Dependent on the reaction
Q4	What is observed when a solution of potassium iodide is added to lead nitrate solution ? a) White precipitate of lead iodide is formed b) Lead Iodide is soluble in water c) No reaction takes place d) Yellow precipitate of Lead Iodide is formed ✓
Q5	Rahul performs an experiment to form aluminium chloride from aluminium and chlorine. Which of the following correctly gives the chemical equation of the reaction? (a) $\text{Al} + \text{Cl}_2 \rightarrow \text{AlCl}_2$ (b) $2\text{Al} + \text{Cl}_2 \rightarrow 2\text{AlCl}$ (c) $2\text{Al} + 3\text{Cl}_2 \rightarrow 2\text{AlCl}_3$ ✓ (d) $3\text{Al} + 3\text{Cl}_2 \rightarrow 3\text{AlCl}_3$
Q6	When copper powder is heated it gets coated with / (a) Black copper oxide (b) Yellow copper oxide (c) Red copper oxide (d) blue copper sulphate
Q7	An aqueous solution of the salt is acidic. Which of the following acids and bases react to give this salt? (a) Strong acid and strong base. (b) Strong acid and weak base ✓ (c) Weak acid and strong base. (d) Weak acid and weak base
Q8	Which of the following are exothermic processes? ✗ (i) Reaction of water with quick lime (ii) Dilution of an acid ✓ (iii) Evaporation of water (iv) Sublimation of camphor (crystals) (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)
Q9	Which of the following statements about the given reaction are correct? $3\text{Fe (s)} + 4\text{H}_2\text{O (g)} \rightarrow \text{Fe}_3\text{O}_4 \text{ (s)} + 4\text{H}_2 \text{ (g)}$ (i) Iron metal is getting oxidised. (ii) Water is getting reduced (iii) Water is acting as a reducing agent (iv) Water is acting as oxidising agent (a) (i), (ii) and (iii) (b) (in) and (iv) (c) (i), (ii) and (iv) ✓ (d) (ii) and (iv)

- 10 When green coloured ferrous sulphate crystals are heated, the colour of the crystal changes because?
 (a) It loses water of crystallisation ✓ (b) It forms Sulphur trioxide gas
 (c) It is decomposed to ferric oxide (d) It forms Sulphur dioxide gas
- 12 A steel object kept in a humid room slowly develops brown flakes. Which type of reaction does this represent?
 (a) Combination (b) Decomposition ✓ (c) Oxidation (d) Double displacement
- 13 In a water purification unit, chlorine reacts with water to form hypochlorous acid. This is an example of:
 (a) Combination ✓ (b) Decomposition (c) Oxidation (d) Double displacement
- 14 In a fire extinguisher, CO_2 is produced by reaction between:
 (a) NaCl and HCl (b) NaHCO_3 and acid (c) CaSO_4 and water (d) KCl and OH^-
- 15 A colourless solid "X" decomposes on heating to give a brown gas and a residue that dissolves in water to form a green solution. The solid "X" is most likely:
 (a) CuCO_3 (b) $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ (c) $\text{Pb}(\text{NO}_3)_2$ ✓ (d) ZnCO_3
- 16 Identify the incorrect balanced equation:
 (a) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ (b) $\text{Ca} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$ ✓
 (c) $2\text{KNO}_3 \rightarrow 2\text{KNO}_2 + \text{O}_2$ (d) $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}_2$
- 17 Reaction between $\text{Pb}(\text{NO}_3)_2$ and KI results in a golden yellow precipitate. The precipitate is:
 (a) PbO (b) PbI_2 ✓ (c) KNO_3 (d) KI_2
- 18 Study the following cases:
 (i) $\text{CuSO}_4 + \text{Mg} \rightarrow$ (ii) $\text{FeSO}_4 + \text{Pb} \rightarrow$ (iii) $\text{CaSO}_4 + \text{Al} \rightarrow$ (iv) $\text{ZnSO}_4 + \text{Ca}$ ✗ ✗
 The case/cases in which new product(s) will form is/are:
 (A) Only (i) (B) Only (iii) (C) (i) and (iv) ✓ (D) (i), (ii) and (iv) ✓
- 19 In the reaction $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$, which of the following statements is correct? (a) Hydrogen is oxidized, and Chlorine is reduced. (b) Hydrogen is reduced, and Chlorine is oxidized. (c) Both Hydrogen and Chlorine are oxidized. (d) Both Hydrogen and Chlorine are reduced ✓
- 20 In the reaction $\text{Zn} + \text{FeSO}_4 \rightarrow \text{ZnSO}_4 + \text{Fe}$, which substance is oxidized?
 (a) Fe (b) Zn (c) FeSO_4 (d) ZnSO_4 ✓

CHAPTER 2 - ACIDS, BASES AND SALTS

- Q1 What is the pH of a neutral solution?
 (a) 0 (b) 7 ✓ (c) 14 (d) 1
- Q2 What is the formula of bleaching powder?
 (a) CaO (b) $\text{Ca}(\text{OH})_2$ (c) CaCl_2 (d) CaOCl_2 ✓

	Which of the following is a weak base? a) NaOH b) KOH <u>c) NH₃</u> d) Ca(OH) ₂ ✓
4	Which of the following statements is correct about an aqueous solution of an acid and of a base? (i) Higher the pH, stronger the acid (ii) Higher the pH, weaker the acid ✓ (iii) Lower the pH, stronger the base (iv) Lower the pH, weaker the base ✓ (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) <u>(d) (ii) and (iv)</u>
Q5	Which of the following statements is correct about an aqueous solution of an acid and of a base? (i) Higher the pH, stronger the acid. (ii) Higher the pH, weaker the acid ✓ (iii) Lower the pH, stronger the base (iv) Lower the pH, weaker the base ✓ (a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) <u>(d) (ii) and (iv)</u>
Q6	Which of the following indicators is an olfactory indicator? (a) litmus (b) vanilla ✓ (c) turmeric (d) phenolphthalein ✓
Q7	Which of the following reactions is used in white washing walls? (a) $2\text{Ca} + \text{O}_2 \rightarrow 2\text{CaO}$. (b) $\text{Ca(OH)}_2 \xrightarrow{\text{Heat}} \text{CaO} + \text{H}_2\text{O}$ ✓ (c) $\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$. <u>(d) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$</u>
Q8	Which of the following salts is basic in nature? (a) NH ₄ NO ₃ <u>(b) Na₂CO₃</u> (c) Na ₂ SO ₄ (d) NaCl ✓
Q9	<p>In the given series of reactions, what are Y and Z respectively?</p> $\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2 + \text{NH}_3 \longrightarrow \text{X} + \text{Y}$ $\begin{array}{c} \Delta \downarrow -\text{H}_2\text{O}, -\text{CO}_2 \\ \text{Z} \end{array}$ $\text{Q} \xleftarrow{+10\text{H}_2\text{O}} \text{Z}$ <p>(Q is used in removing permanent hardness of water.)</p> <p>(a) NaHCO₃, NaOCl₂ (b) NH₄Cl, Na₂CO₃. (c) Na₂CO₃, NH₄Cl <u>(d) Na₂CO₃, NaHCO₃</u> ✗</p>
Q10	What happens when a solution of an acid is mixed with a solution of a base in a test tube? (i) The temperature of the solution increases (ii) The temperature of the solution decreases ✓ (iii) The temperature of the solution remains the same. (iv) Salt formation takes place ✓ (A) (i) only (B) (i) and (iii). (C) (ii) and (iii) <u>(D) (i) and (iv)</u>
Q12	The aqueous solution of sodium acetate is <u>(a) basic</u> (b) neutral (c) acidic (d) none of these ✓
Q13	Generally metals react with acids to give salt and hydrogen gas. Which of the given acids does not give hydrogen gas on reacting with metals (except Mn and Mg)?

	(a) H_2SO_4 (b) HCl (c) HNO_3 (d) All the these
Q14	Plaster of Paris hardens on adding water because of: (a) Heating (b) Hydration. (c) Neutralisation. (d) Displacement
Q15	Which of the given option represents a family of salts ? (A) NaCl , Na_2SO_4 , CaSO_4 . (B) K_2SO_4 , Na_2SO_4 , CaSO_4 ✓ (C) NaNO_3 , CaCO_3 , Na_2CO_3 . (D) MgSO_4 , CuSO_4 , MgCl_2
Q16	Consider the following reactions : (i) Dilute hydrochloric acid reacts with sodium hydroxide. (ii) Magnesium oxide reacts with dilute hydrochloric acid. (iii) Carbon dioxide reacts with sodium hydroxide. It is found that in each case : (A) Salt and water is formed. ✓ (B) Neutral salts are formed. (C) Hydrogen gas is formed. (D) Acidic salts are formed.
Q17	An aqueous solution of which of the following salts will have a pH value more than 7? (a) NaCl (b) NH_4Cl (c) CH_3COONa (d) K_2S ✓
Q18	An aqueous solution with a pH value of 0 would be considered: (a) Strongly acidic (b) Strongly basic ✓ (c) Neutral (d) Weakly acidic
Q19	Which of the following substances is used in soda-acid fire extinguishers? (a) Sodium carbonate (b) Sodium hydrogencarbonate (c) Sodium chloride (d) Calcium hydroxide ✓
Q20	Which of the following solutions will turn blue litmus paper red? (a) Sodium hydroxide solution (b) Pure water (c) Dilute hydrochloric acid (d) Baking soda solution

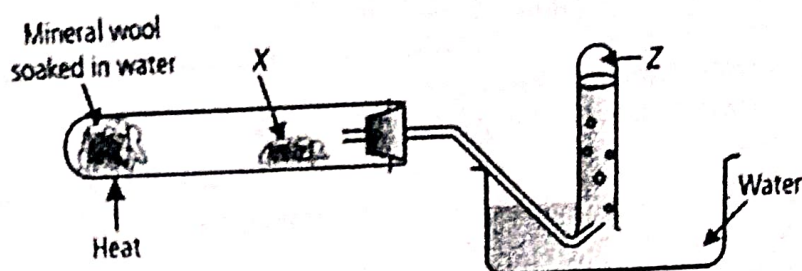
CHAPTER 3 - METALS AND NON METALS

Q1	The poorest conductor of heat among metals is (a) Lead (b) Mercury (c) Calcium (d) Sodium ✓
Q2	Which one of the following substances will not give carbon dioxide on treatment with dilute acid? (a) Marble (b) Limestone (c) Baking soda (d) Lime ✓
Q3	Which of the following is the correct arrangement of the given metals in ascending order of their reactivity? Zinc, Iron, Magnesium, Sodium (a) $\text{Zinc} > \text{Iron} > \text{Magnesium} > \text{Sodium}$ (b) $\text{Sodium} > \text{Magnesium} > \text{Iron} > \text{Zinc}$ ✓ (c) $\text{Sodium} > \text{Zinc} > \text{Magnesium} > \text{Iron}$ (d) $\text{Sodium} > \text{Magnesium} > \text{Zinc} > \text{Iron}$
Q4	What is the product obtained when zinc carbonate is heated? a) Zinc oxide b) Zinc nitrate c) Zinc sulphate (d) Zinc chloride ✓

5	Which of the following metals is stored in kerosene? (a) Sodium (b) Magnesium ✓ (c) Aluminium (d) Iron X
Q6	The chemical reaction involved in the thermite process is: (a) Displacement reaction (b) Combination reaction ✓ (c) Redox reaction (d) Neutralization reaction
Q7	The process of coating iron with zinc to prevent rusting is called: (a) Electroplating (b) Galvanization ✓ (c) Alloying (d) Anodizing
Q8	When copper oxide and dilute hydrochloric acid react, colour changes and compound formed: (a) white copper hydroxide (b) bluish-green copper chloride ✓ (c) blue-black copper oxide (d) blue copper hydroxide ✓
Q9	When Silver (Ag) is exposed to air it gets a black coating of (a) AgNO_3 (b) Ag_2S (c) Ag_2O ✓ (d) Ag_2CO_3 X
Q10	Reaction between X and Y forms compound Z. X loses an electron and Y gains an electron. Which of the following properties is not shown by Z? (a) Has a high melting point. ✓ (b) Has a low melting point. (c) Conducts electricity in molten state. (d) Occurs as solid.
Q12	Statement A: Zinc is used in the galvanization of iron Statement B: Its coating on Iron articles increasing the life of it by protecting it from rusting (a) Statement A is correct only. (b) Statement A is correct only ✓ (c) Both Statement A and B are correct (d) Both Statement A and B are incorrect
Q13	Copper displaces which of the following metal from its salt solution (a) ZnSO_4 (b) FeSO_4 (c) AgNO_3 ✓ (d) NiSO_4
Q14	The highly reactive metals like Sodium, Potassium, Magnesium, etc. are extracted by the (a) electrolysis of their molten chloride ✓ (b) electrolysis of their molten oxides (c) reduction by aluminium (d) reduction by carbon
Q15	Two metals zinc and tin are dissolved separately in definite proportions in molten copper (the primary metal) to obtain two different alloys respectively known as : (A) Bronze and Brass ✓ (B) Brass and Solder (C) Brass and Bronze (D) Solder and Bronze X
Q16	Aluminium powder is used in thermit welding because : (A) Its reaction with iron is highly exothermic. (B) When it is heated with iron (III) oxide, molten iron is obtained. ✓ (C) When it is heated with iron (III) oxide, molten aluminium oxide is obtained to join railway tracks.

(D) Its melting point is low as compared to iron and a molten alloy of iron and aluminium is formed on heating which is used to join railway tracks.

Q17 The given apparatus shows the reaction of steam with heated solid 'X'.



The equation for the reaction is
 Steam + Solid 'X' → Solid 'Y' (Residue) + Gas 'Z' X, Y and Z are respectively.

- (a) copper, copper oxide, oxygen (b) lead, lead oxide, hydrogen
 (c) silver, silver oxide, oxygen (d) iron, iron oxide, hydrogen.

Q18 The metals obtained from their molten chlorides by the process of electrolytic reduction are :

- (A) Gold and silver (B) Calcium and magnesium
 (C) Aluminium and silver (D) Sodium and iron

Q19 Roasting is a process in metallurgy primarily used for converting:

- (a) Sulphide ores into oxides. (b) Carbonate ores into oxides.
 (c) Oxide ores into metals. (d) Sulphide ores into sulphates.

Q20 Which one of the following statements about copper refining is incorrect.

- (a) Pure metal is deposited on cathode
 (b) Impure metal is taken as anode
 (c) Electrolyte solution is acidified copper sulphate
 (d) Electrolytic refining is done to extract the metal from its ore.

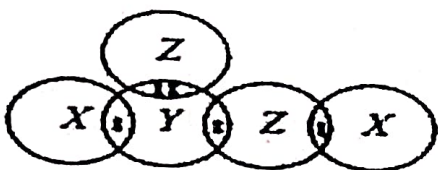
CHAPTER 4 - CARBON AND ITS COMPOUNDS

Q1 Which of the following represents the structure of N_2 molecule ?
 (a) $N \equiv N$ (b) $N = N$ (c) $N - N$ (d) None of the above

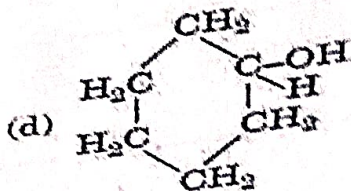
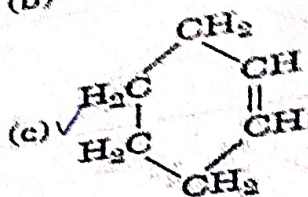
Q2 Which of the following is not a saturated hydrocarbon?
 (a) Methane (b) Ethane (c) Ethene (d) Propane

Q3 Which of the following will give a pleasant smell of ester when heated with ethanol and a small quantity of sulphuric acid?
 (a) CH_3COOH (b) CH_3CH_2OH (c) CH_3OH (d) CH_3CHO

Q4 Methane, ethane and propane are said to form a homologous series because all are:

	(a) Hydrocarbons (c) Unsaturated compounds	(b) Saturated compounds ✓ (d) Each consecutive member differ from each other by a CH ₂ group X
Q5	The functional group present in ethanol is: (a) -CHO (b) -COOH (c) -OH ✓ (d) -CO ✓	
Q6	Ethanol reacts with ethanoic acid to form: (a) Ester ✓ (b) Aldehyde (c) Ketone (d) Alkene ✓	
Q7	What is the valency of carbon? (a) 2 (b) 3 (c) 4 ✓ (d) 6 ✓	
Q8	Ethanol on complete oxidation gives ✓ (a) acetic acid/ethanoic acid (b) CO ₂ and water (c) ethanal (d) acetone X	
Q9	Which of the following belongs to the homologous series of alkynes? C ₆ H ₆ , C ₂ H ₆ , C ₂ H ₄ , C ₃ H ₄ . (a) C ₆ H ₆ (b) C ₂ H ₄ (c) C ₂ H ₆ (d) C ₃ H ₄ ✓	
Q10	Vinegar is a solution of (a) 50% – 60% acetic acid in alcohol (c) 5% – 8% acetic acid in water ✓	(b) 5% – 8% acetic acid in alcohol (d) 50% – 60% acetic acid in water
Q12	The given diagram shows the arrangement of valence electrons in organic compound Q, having molecular formula X ₂ YZ ₂ . What could be the compound Q: (a) Methanol (b) Ethanol (c) Methanoic acid (d) Ethanoic acid ✓ 	
Q13	Which of the following will give a pleasant smell of ester when heated with ethanol and a small quantity of sulphuric acid? (a) CH ₃ COOH (b) CH ₃ CH ₂ OH (c) CH ₃ OH (d) CH ₃ CHO ✓	
Q14	A soap molecule has a - (a) hydrophobic head and hydrophobic tail (b) hydrophobic head and hydrophilic tail (c) hydrophilic head and hydrophilic tail (d) hydrophilic head and hydrophobic tail ✓	
Q15	Which of the following compounds can undergo an addition reaction with hydrogen?	

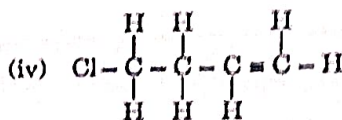
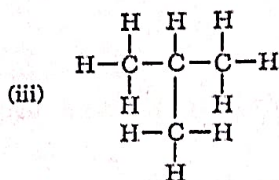
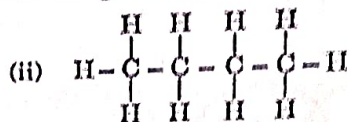
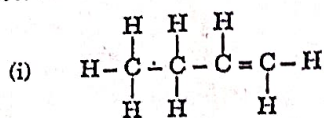
- (a) $\text{CH}_3(\text{CH}_2)_4\text{CH}_3$
 (b) $\text{CH}_3\text{CH}_2\text{OH}$



- Q16 The properties of two gases, P and Q, are given here.
 (1) P dissolves in aqueous sodium hydroxide but Q does not.
 (2) Q does not decolourise aqueous bromine.
 (3) When Q burns in excess oxygen, the products are P and water only.
 What are P and Q likely to be?

	P	Q
(a)	Carbon dioxide	Ethane
(b)	Carbon dioxide	Ethane ethene
(c)	Carbon monoxide	Ethane
(d)	Ethane	Ethane

- Q17 Given below are the structures of some hydrocarbons. Select the two structures which are related to each other from the given options :



- (A) (i) and (iv) (B) (ii) and (iii) (C) (ii) and (iv) (D) (i) and (iii)

- Q18 The alkene with the molecular formula C_4H_8 is known as butene. How many hydrogen atoms are present in one molecule of butene?

- (a) 4 (b) 6 (c) 8 (d) 10

- Q19 A hydrocarbon has the molecular formula C_3H_4 . It belongs to the homologous series of: (a) Alkanes (b) Alkenes (c) Alkynes (d) Alcohols

- Q20 How many structural isomers can be drawn for pentane (C_5H_{12})?

- (a) 2 (b) 3 (c) 4 (d) 5

P-16

Pre-Board-I Examination (2025-26) SET-2

CLASS: X

SUBJECT: SCIENCE

MAXIMUM MARKS: 80

DURATION: 3 HRS

General Instructions:

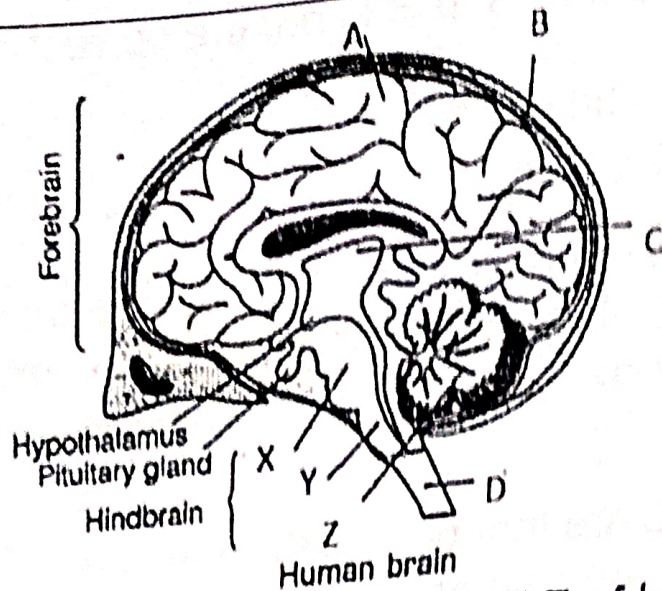
(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

SECTION-A		
1.	Which of the following statements are true for flowers? (i) Flowers are always bisexual (ii) They are the sexual reproductive organs (iii) They are produced in all groups of plants (iv) After fertilisation they give rise to fruits A. (ii) and (iv) B. (ii) and (iii) C. (i) and (iii) D. (i) and (iv)	1
2.	Which of the following options indicates the products formed after breakdown of the glucose in our muscle cells when there is lack of oxygen? A. Ethanol + carbon dioxide + Energy B. Lactic acid + Energy C. Lactic acid + carbon monoxide + Energy D. Carbon dioxide + Water + Energy	1
3.	Which of the following human activities has resulted in an increase of non-biodegradable substances? A. Organic farming B. Increase in tree plantation C. Use of plastic as packaging material D. Composting of kitchen waste	1
4.	Choose the correct statement that describes arteries: A. They have thick elastic walls, blood flows under high pressure; collect blood from different organs and bring it back to	1

	<p>the heart.</p> <p>B. They have thin walls with valves inside, blood flows under low pressure and carry blood away from the heart to various organs of the body.</p> <p>C. They have thick elastic walls, blood flows under low pressure; carry blood from the heart to various organs of the body.</p> <p>D. They have thick elastic walls without valves inside. The Blood flows under high pressure and carry blood away from the heart to different parts of the body.</p>	
5.	<p>In a cross between black furred rabbit (B) and white furred rabbit (b), all offspring were found to have black fur. What can be inferred about the genetic makeup of the parent rabbits?</p> <p>A. BB X bb B. Bb X Bb C. Bb X bb D. bb X bb</p>	1
6.	<p>Which of the following is a correct combination of function and part of the brain?</p> <p>A. Posture and balance: Cerebrum</p> <p>B. Blood pressure: Medulla in hindbrain</p> <p>C. Hunger: Pons in hindbrain</p> <p>D. Salivation: Medulla in midbrain</p>	1
7.	<p>In a food chain if frog is eaten by snake then the energy transfer will be from</p> <p>A. producer to primary consumer</p> <p>B. primary consumer to secondary consumer</p> <p>C. secondary consumer to tertiary consumer</p> <p>D. Producer to decomposer</p>	1
	<p>Assertion (A): Vulture will always have the least amount of pesticides in a food chain.</p> <p>Reason (R): Vulture occupies the last trophic level and it gets only 10% of energy of the previous trophic level.</p> <p>A. Both A and R are true and R is the correct explanation of A</p>	1

	<p>B. Both A and R are true and R is not the correct explanation of A</p> <p>C. A is true but R is false</p> <p>D. A is False but R is true</p>	
9.	<p>Assertion (A): When pure breed tall plants are crossed with pure breed short plants, all the plants in F₁ progeny are tall. When the tall plants of F₁ progeny are crossed, short plants re-appear in F₂ progeny.</p> <p>Reason (R): Traits are independently inherited.</p> <p>A. Both A and R are true and R is the correct explanation of A</p> <p>B. Both A and R are true and R is not the correct explanation of A</p> <p>C. A is true but R is false</p> <p>D. A is False but R is true</p>	1
10	List two changes in habit that people must adopt to dispose non-biodegradable waste that will contribute for saving the environment.	2
11	<p><u>Attempt either option A or B.</u></p> <p>A. How many chambers are there in the heart of the following organisms? How is mixing of oxygenated and deoxygenated blood prevented in their body?</p> <p>(i) Fishes</p> <p>(ii) Humans</p> <p style="text-align: center;">OR</p> <p>B. Explain the mechanism by which the water is transported in plants?</p>	2
12	<p>(a) What happens to the heart when muscles work harder?</p> <p>(b) Which body system is directly affected when a person has heart disease?</p> <p>(c) Which cells increase in number during infection?</p>	2
13	Given below is a diagram of human brain.	3



- (a) Identify the parts labelled as X, Y and Z of hind brain.
 (b) Write any one function of the part labelled as A, B and C

- 14 In a genetic experiment, plants with pure round green seeds (RRyy) were crossed with plants with wrinkled yellow seeds (rrYY).

- (i) Show the gametes formed when F₁ was self-pollinated.
 (ii) A total of 144 seeds were produced which developed into saplings. Show the ratio in which these traits are independently inherited in these 144 sapling.

- 15 Neha consumed boiled sweet potatoes and boiled eggs for breakfast. Help her to understand some steps in the process of digestion of the food taken by her by answering the questions given below.

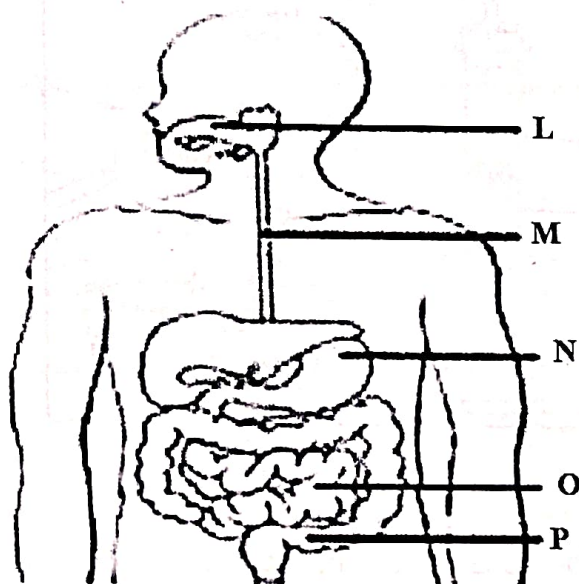
Attempt either subpart A or B.

A. Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required and the glands associated with the digestion here.

OR

B. Which of these food items contains fats? How is it digested?
 C. Which of these food items is rich in starch? How is its digestion initiated?

D. The figure given below represents parts of the human alimentary canal. Which of these parts (L, M, N, O or P) will have the maximum amount of digested food as soon as the process of digestion is completed ?



For visually impaired students

D. What are the main parts of alimentary canal and mention the role of large intestine ?

16

Attempt either option A or B.

A. (i) What happens when :-

- (a) Planaria gets cut into many pieces accidentally.
- (b) Bryophyllum leaf falls on the wet soil.
- (c) On maturation sporangia of Rhizopus bursts?

(ii) What is vegetative propagation? Explain any three advantages of vegetative propagation.

OR

B. Annie was conducting research on the number of fruits produced by watermelon under different conditions. She grew 25 watermelon plants each in both glass house A and B. She introduced pollinators in glass house A only.

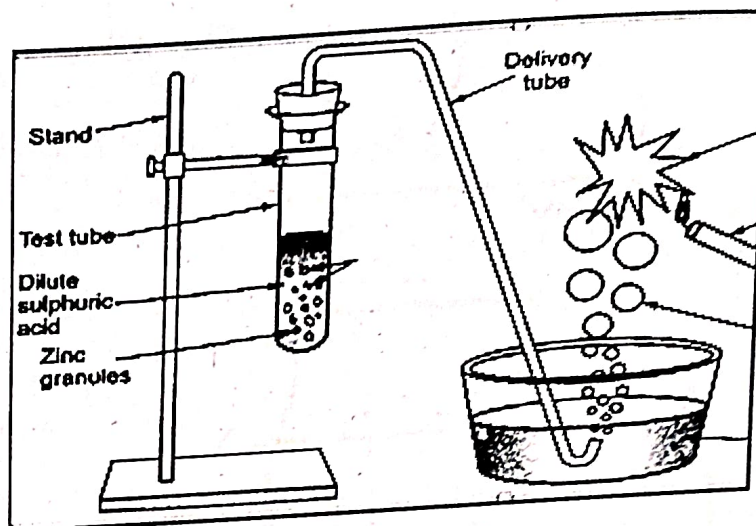
(i) What difference will she observe in the number of fruits produced in the two glass houses? Explain with reason.

5

(ii) List 3 changes that will occur in a flower once it gets fertilized.

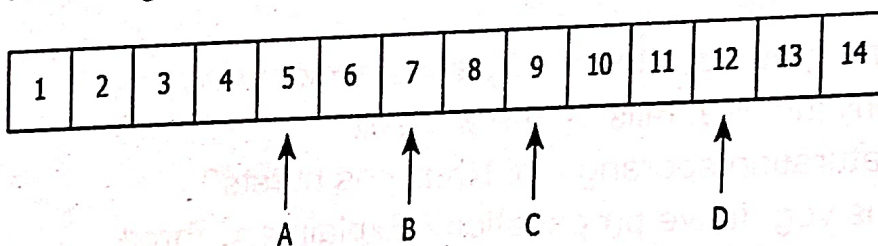
SECTION-B

17 What will be observed in the reaction shown in the figure?



- A. Carbon dioxide gas will be released
- B. Hydrogen gas will be released with pop sound
- C. Carbon dioxide gas will be released and solution become milky
- D. Hydrogen gas along with carbon dioxide gas will be released

18 The image shows the pH values of four solutions on a pH scale.



Which solutions are alkaline in nature?

- A. A and B
- B. B and C
- C. C and D
- D. A and D

19 The water of crystallization is present in

- (i) Bleaching Powder
- (ii) Plaster of Paris
- (iii) Washing Soda
- (iv) Baking Soda

- A. (ii) and (iv)
- B. (ii) and (iii)

C. (i) and (ii)

D. (i) and (iv)

20 The first member of alkyne homologous series is

1

A. ethyne

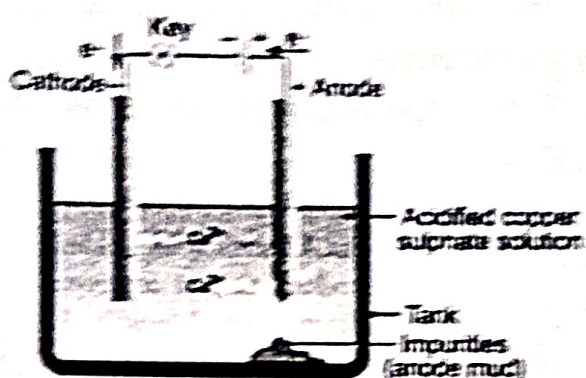
B. ethane

C. propyne

D. methane

21 The image shows the electrolytic refining of copper.

1



Which option explains the process to obtain pure copper?

A. When current is passed, pure copper from cathode deposits to the anode.

B. When current is passed, pure copper from anode deposits in the electrolytic solution.

C. When current is passed, pure copper from the electrolytic solution deposits at the anode.

D. When current is passed, pure copper from the electrolytic solution deposits at the cathode.

22 When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of:

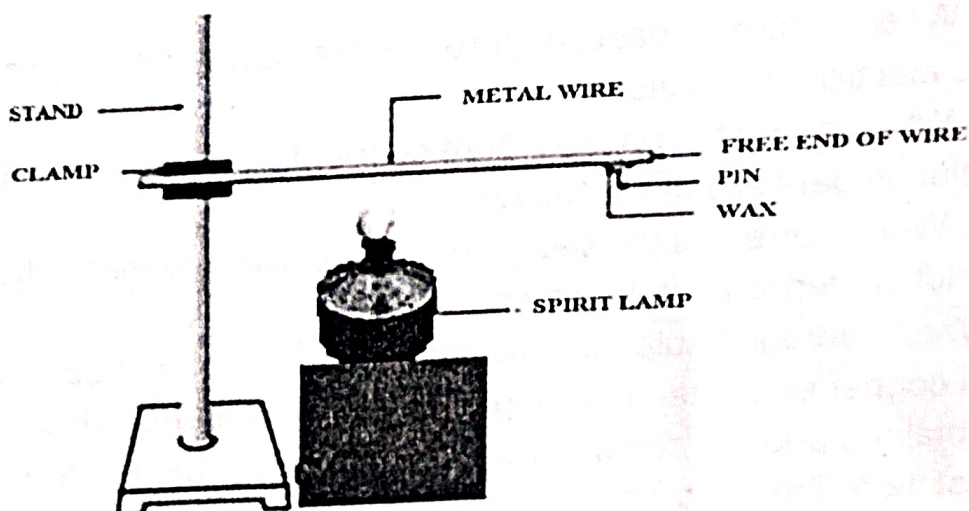
1

A. combination reaction

B. single displacement reaction

C. double decomposition reaction

	D. displacement reaction	
23	In the reaction of aqueous solution of barium chloride with aqueous solution of sodium sulphate, the aqueous solution formed will be: A. BaCl_2 B. BaSO_4 C. Na_2SO_4 D. NaCl	1
24	Assertion (A): C_4H_8 , C_4H_6 and C_4H_{10} are members of the same homologous series Reason (R): C_4H_8 , C_4H_6 , C_3H_4 , C_3H_6 , C_2H_4 , C_2H_2 are unsaturated hydrocarbons. A. Both A and R are true and R is the correct explanation of A B. Both A and R are true and R is not the correct explanation of A C. A is true but R is false D. A is False but R is true	1
25	The following activity is set-up in the science lab by the teacher. He clamped an aluminium wire on a stand and fixed a pin to the free end of the wire using wax. Then he heated the wire with a burner from the end where the wire is clamped. Students observed the pin fall off.	2



- A. If the teacher replaces aluminium wire by silver wire; will the students' observation change? Justify your answer.
B. Will the aluminium wire melt? Give reason for your answer.

For visually impaired students

- A. Where is sodium is stored to keep it safe from air and water ?
 B. Why gold and silver are used to make jewellery?

26 Attempt either option A or B.

3

A. During electrolysis of brine, a gas 'G' is liberated at anode. When this gas 'G' is passed through slaked lime, a compound 'C' is formed, which is used for disinfecting drinking water.

- (a) Write the formula of 'G' and 'C'.
 (b) State the chemical equation involved in the formation of compound C.
 (c) What is the common name of compound 'C'? Give its chemical name.

OR

B. Distinguish between 'roasting' and 'calcination' .(any two)
 Which of these two is used for sulphide ores and why?

27 2g of ferrous sulphate crystals are heated in a boiling tube.

3

- (a) State the colour of ferrous sulphate crystals both before heating and after heating.
 (b) Name the gases produced during heating.
 (c) Write the chemical equation for the reaction.

28 A compound which is prepared from Gypsum has the property of hardening when mixed with water.

4

- (a) Identify this compound.
 (b) Write the chemical equation for its preparation.

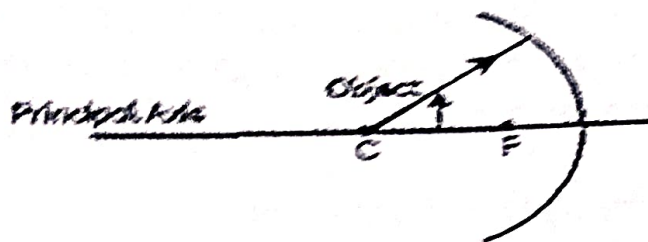
OR

- (b) What will happen if Gypsum is heated for a longer time?
 (c) For what purpose will this compound be used in the hospitals?

	(d) How many molecules of water of crystallization are present in gypsum?	
29	<p><u>Attempt either option A or B.</u></p> <p>A compound X is formed by the reaction of a carboxylic acid $C_2H_4O_2$ and an alcohol in presence of a few drops of H_2SO_4. The alcohol on oxidation with alkaline $KMnO_4$ followed by acidification gives the same carboxylic acid as used in this reaction.</p> <p>Give the names and structures of</p> <p>(a) carboxylic acid, (b) alcohol and (c) the compound X. Also write the reaction.</p> <p style="text-align: center;">OR</p> <p>B. (i) Draw the electron dot structure of 3rd member of alkyne series. (ii) Differentiate between addition reaction and substitution reaction. Give one example of each. (iii) Name an oxidising agent which converts ethanol to ethanoic acid.</p>	5
SECTION-C		
30	<p>Choose the correct option from the below which explains the reason for us to perceive the day sky as blue.</p> <p>A. As sunlight passes through the atmosphere, shorter wavelengths, such as blue are scattered more than other colors. B. The sky appears blue because all colors are scattered equally, but blue light is stronger and more visible to the human eye. C. The blue color of the sky is due to longer wavelengths like red and orange scattering more than shorter wavelengths, making blue stand out more. D. The atmosphere contains blue-colored particles that give the sky its blue appearance.</p>	1

31 Identify the correct conclusions that can be drawn based on the diagram of the concave mirror given below.

1



- I) the image of the object will be inverted
- II) the focal length will be negative
- III) the image of the object will be virtual
- IV) the reflected ray will travel along the same path as the incident ray in the opposite direction

(A) I and III (B) I, II and IV (C) III and IV (D) II and III

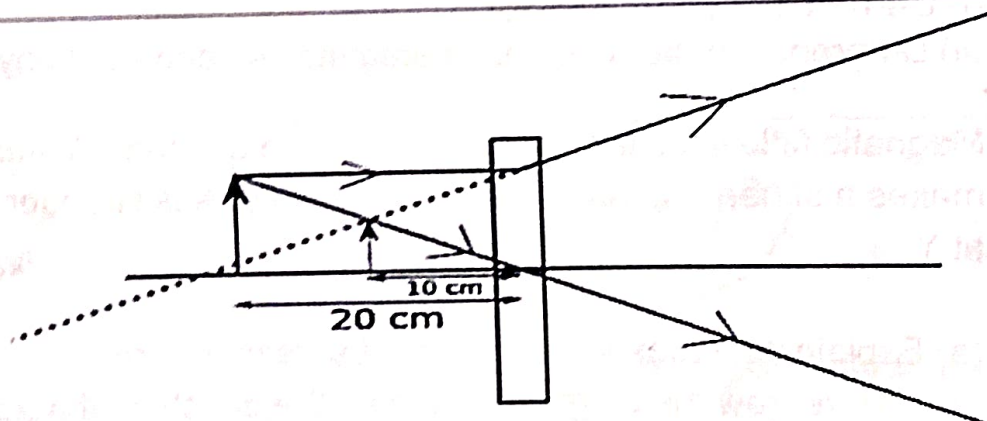
32 Assertion (A): A point object is placed at a distance of 26 cm from a convex mirror of focal length 26 cm. The image will not form at infinity.

1

Reason (R): For above given system the equation $1/f = 1/v + 1/u$ gives $v = \infty$.

- A. Both A and R are true and R is the correct explanation of A
- B. Both A and R are true and R is not the correct explanation of A
- C. A is true but R is false
- D. A is False but R is true

33



2

The above image shows the formation of an image with an optical instrument.

- A. Identify the optical instrument (shown schematically as a rectangle) in the image.
 B. What type of image is formed in this case?
 C. Based on the measurements given in the image, calculate the focal length of the instrument.

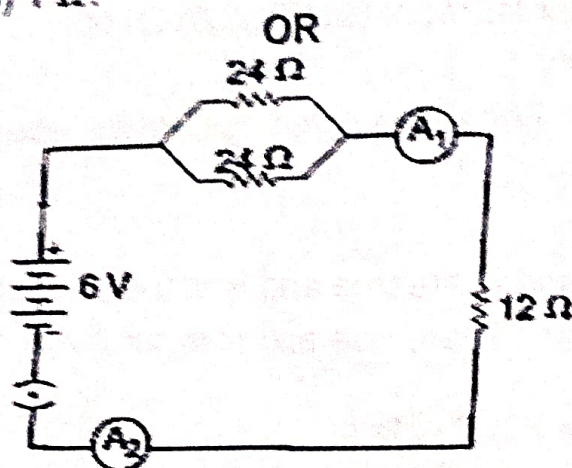
For visually impaired students

- A. Under what conditions can a convex lens form a virtual image?
 B. Why does a piece of paper catch fire if we allow sunlight to pass through a convex lens onto the paper?

34 Attempt either option A or B.

2

- A. How can three resistors of resistances $2\ \Omega$, $3\ \Omega$, and $6\ \Omega$ respectively be connected to give a total resistance of
 (a) $4\ \Omega$ (b) $1\ \Omega$?



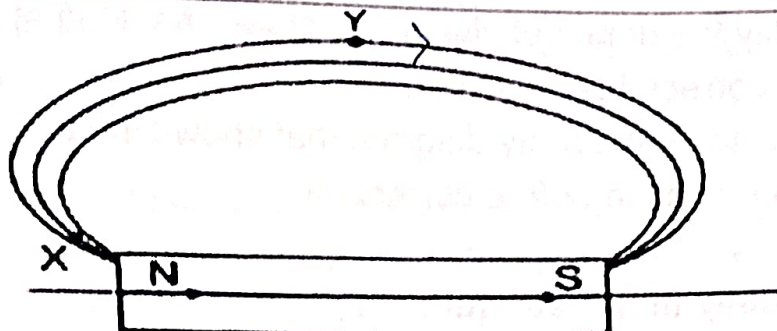
Study the circuit and find out-

- (i) Current in 12-ohm resistor
 (ii) Difference in the readings of ammeter A_1 and A_2 if any

35 Magnetic field lines are shown in the given diagram. A student makes a statement that the magnetic field at X is stronger than at Y.

3

- (a) Explain with reason if the student's claim is correct.
 (b) Also redraw the diagram and mark the direction of magnetic field lines.



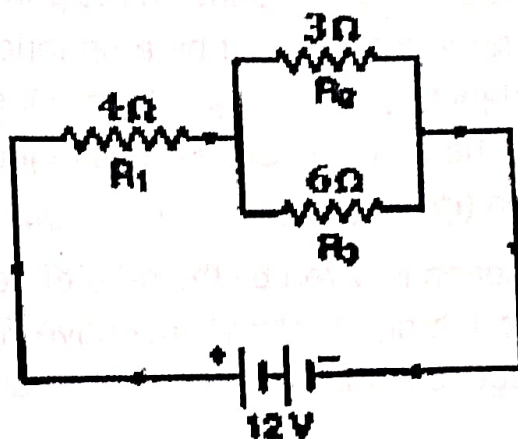
For visually impaired students:

- Write down two properties of magnetic field lines.
- When does an electric short circuit occur?

36

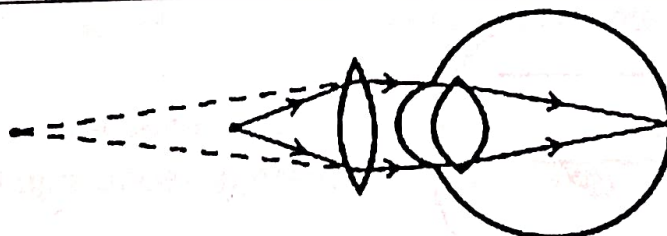
Observe the Circuit diagram and answer the following questions:

3



- Find the equivalent resistance of the circuit.
- What amount of current is flowed in the circuit?
- What would be the equivalent resistance when R_1 and R_2 were interchanged?

37



3

The above image shows a corrective measure for a particular defect of vision.

- (i) Identify the defect of vision and state what kind of lens is used to correct this deficiency.
- (ii) Draw and label a ray diagram that shows the defect of vision in the above case before correction.

For visually impaired students

- (i) State one function of each of them—(a) Retina (b) Pupil
- (ii) What is power of accommodation?

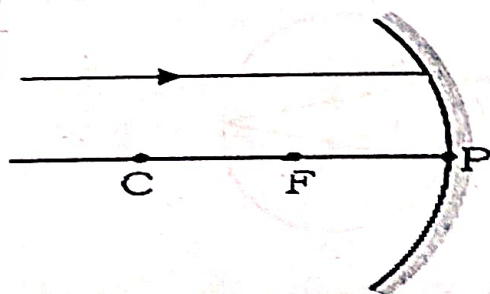
38

The relation between distance of an object from the mirror (u), distance of image from the mirror (v) and the focal length (F) is called mirror formula. This formula is valid in all situations for all spherical mirrors for all positions of the object. The size of image formed by a spherical mirror depends on the position of the object from the mirror. The image formed by a spherical mirror can be bigger than the object, equal to the object or smaller than the object. The size of the image relative to the object is given by the linear magnification (m).

Thus, the magnification is given by the ratio of height of image to the height of object. If magnification is negative, image is real and if it is positive, image is virtual.

(a) What is the position of an image when an object is placed at a distance of 20 cm from a concave mirror of focal length 20 cm?

(b) Complete the following ray diagrams for the ray of light incident on a concave mirror as shown in figure.



Concave Mirror

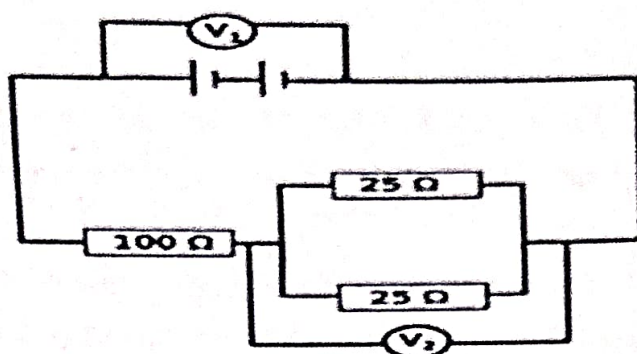
(c) If the magnification of an image is -1 , write the characteristic of the image.

OR

(c) A parallel beam of light is made to fall on a concave mirror. An image is formed at a distance of 7.5 from the mirror. Calculate the focal length of the mirror.

39 Attempt either option A or B.

5



A. The arrangement of resistors shown in the above figure is connected to a battery;

The power dissipation in the $100\ \Omega$ resistor is 81 W . Calculate

- the current in the circuit
- the reading in the voltmeter V_2
- the reading in the voltmeter V_1

OR

B. (i) State ohm's law?

(ii) The value of (I) current following through a conductor for the corresponding values of (V) potential difference are given below

V	0.5	0.1	1.5	2.0	2.5	3.0
I	0.1	0.2	0.3	0.4	0.5	0.6

Plot a graph between V and I and also calculate resistance.

(iii) What is the better way of connecting lights and other electrical appliances in domestic wiring? Why?

For visually impaired students

A(i) What is electrical resistivity? In a series electrical circuit comprising a resistor made up of a metallic wire, the ammeter reads 5A. The reading of ammeter decreases to half when the length of wire is doubled. Why?

(ii) Name the device to measure – Current and voltage/potential difference

OR

B. 1. Explain the following-

(i) Why is tungsten used almost for filament of electrical lamps?

(ii) Why copper and aluminium wire usually used for electricity transmission?

(iii) How does the resistance vary with its area of cross-section?

2. 100 J of heat is produced each second in a 4 ohm resistance. Find the potential difference across the resistor.

