



INDIAN SCHOOL SOHAR
PRE-BOARD I EXAMINATION (2023-24)
SCIENCE THEORY (086)
SET-2

No of Printed Pages: 07

CLASS: X
DATE: 10/01/2024

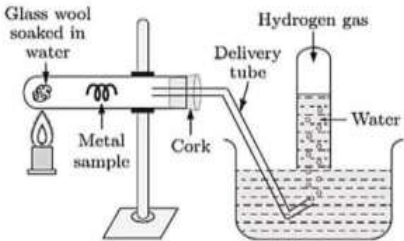
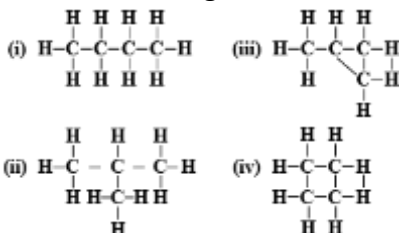
MAX. MARKS: 80
TIME: 3 HOURS

General Instructions:

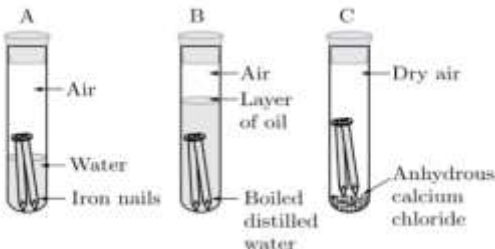
- This question paper consists of 39 questions in 5 sections.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section A consists of 20 objective type questions carrying 1 mark each.
- Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

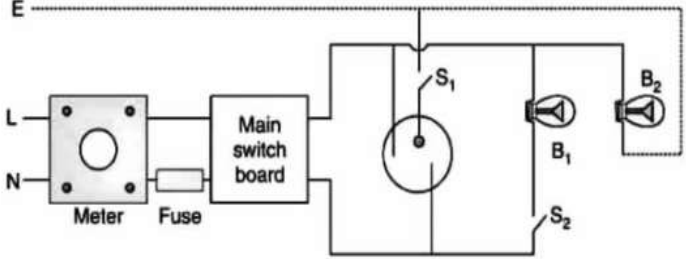
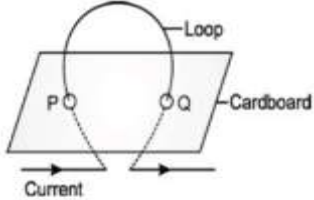
Section-A

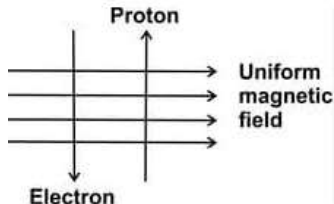
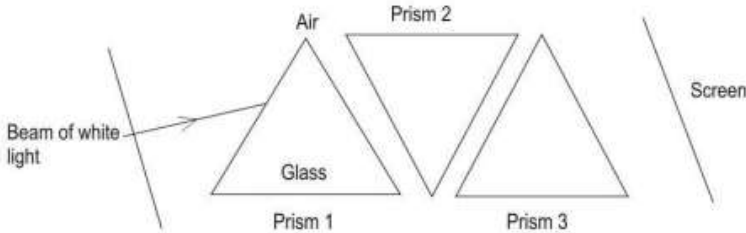
Select and write the most appropriate option out of the four options given for each of the questions 1 -20.

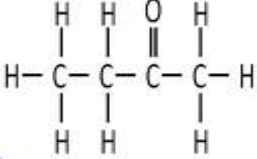
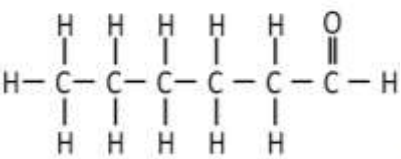
1	In double displacement reaction between aqueous potassium iodide and aqueous lead nitrate. Yellow precipitate of lead iodide is formed while performing the activity. If lead nitrate is not available which of the following can be used in place of lead nitrate? (a) Lead sulphate (b) Lead acetate (c) Ammonium nitrate (d) Potassium sulphate	1
2	Action of steam on a metal is shown in the figure.  The metal sample in the above experiment is (a) Zinc (b) Copper (c) Aluminium (d) Platinum	1
3	Which of the following are present in a dilute aqueous solution of hydrochloric acid? (a) $\text{H}_3\text{O}^+ + \text{Cl}^-$ (b) $\text{H}_3\text{O}^+ + \text{OH}^-$ (c) $\text{Cl}^- + \text{OH}^-$ (d) Unionized HCl	1
4	Which of the following are correct structural isomers of butane?  (a) (i) and (ii) (b) (ii) and (iv) (c) (i) and (ii) (d) (iii) and (iv)	1

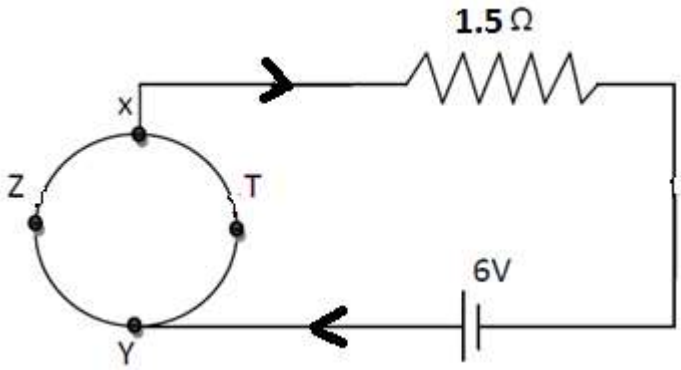
5	A student adds some metallic ash in water taken in a test tube. The ash gets completely dissolved in water and the solution changes its colour. What should the student do next to test the chemical properties of the product formed? (a) Evaporate the solution to get crystals. (b) Measure the temperature change using a thermometer. (c) Observe the evolution of gas. (d) Test the basicity using a red litmus paper.	1
6	An element X has electronic configuration 2,8,1 and another element Y has electronic configuration 2,8,7. They form a compound Z . The property that is not exhibited by Z is: (a) it has high melting point (b) it is a good conductor of electricity in its pure solid state (c) it breaks into pieces when beaten with hammer (d) it is soluble in water	1
7	Ethanol reacts with sodium and forms two products. These are: (a) sodium ethanoate and hydrogen (b) sodium ethanoate and oxygen (c) sodium ethoxide and hydrogen (d) sodium ethoxide and oxygen	1
8	Choose the event that does not occur in photosynthesis. (a) Absorption of light energy by chlorophyll. (b) Reduction of carbon dioxide to carbohydrates. (c) Oxidation of carbon to carbon dioxide. (d) Conversion of light energy to chemical energy	1
9	Which of the given statements are true about thyroxine? (A) Iron is essential for the synthesis of thyroxine. (B) It regulates carbohydrates, proteins and fat metabolism in the body. (C) Thyroid gland controls the release of growth hormone. (D) Sea food is essential for the production of thyroxine. (a) A and B (b) B and C (c) C and D (d) B and D	1
10	Which of the following is the correct sequence of events of sexual reproduction in a flower? (a) pollination → fertilisation → seed germination → embryo development (b) seed germination → embryo development → fertilisation → pollination (c) pollination → fertilisation → embryo development → seed germination (d) embryo development → seed germination → pollination → fertilisation	1
11	If a tall pea plant is crossed with a pure dwarf pea plant then, what percentage of F1 and F2 generation respectively will be tall? (a) 25%, 25% (b) 50%, 50% (c) 75%, 100% (d) 100%, 75%	1
12	Lack of oxygen in muscles often leads to cramps in athletes. This is due to, (a) Conversion of pyruvate to ethanol. (b) Conversion of pyruvate to glucose. (c) Non-conversion of glucose to pyruvate. (d) Conversion of pyruvate to lactic acid.	1
13	In an electrical circuit three incandescent bulbs A, B and C of rating 40 W, 60 W and 100 W respectively are connected in parallel to an electric source. Which of the following is likely to happen regarding their brightness? (a) Brightness of all the bulbs will be the same (b) Brightness of bulb A will be the maximum	1

	(c) Brightness of bulb B will be more than that of A (d) Brightness of bulb C will be less than that of B	
14	Consider the following properties of virtual images: (i) cannot be projected on the screen (ii) are formed by both concave and convex lens (iii) are always erect (iv) are always inverted The correct properties are: (a) i and iv (b) i and ii (c) i,ii and iii (d) i,ii and iv	1
15	Which of the following limits the number of trophic levels in a food chain? (a) Decrease in energy at higher trophic levels (b) Lack of food supply (c) Polluted air (d) Water	1
16	Disposable plastic plates should not be used because (a) they are made of materials with light weight. (b) they are made of toxic materials. (c) they are made of biodegradable materials. (d) they are made of non-biodegradable materials.	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 : When iron nail is dipped in copper sulphate solution, the iron nail becomes brownish in colour and the blue colour of copper solution fade. Reason : Equation representing this change is: $\text{Cu} + \text{FeSO}_4 \rightarrow \text{CuSO}_4 + \text{Fe}$	1
18	Assertion : Oral contraceptive pills can cause side effects. Reason : Oral pills change hormonal balance of the body.	1
19	Assertion : On freely suspending a current – carrying solenoid, it comes to rest in Geographical N-S direction. Reason : One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole, just like a bar magnet.	1
20	Assertion : Fungi are natural cleansers. Reason : Plants break down dead remains into nutrients of soil.	1
Section-B		
Question No. 21 to 26 are very short answer questions		
21	In the arrangement shown below there are three test tubes marked A , B and C . Few clean iron nails are placed in these tubes. Water is poured in test tube A , boiled distilled water and 1 mL of oil are poured in test tube B and anhydrous calcium chloride is added in test tube C .  What are the two observations that can be observed after a few days from the given arrangement?	2

22	In tobacco plant, the male gametes have twenty-four chromosomes. (a) What is the number of chromosomes in the female gamete? (b) What is the number of chromosomes in the zygote?	2
23	Why is small intestine in herbivores longer than in carnivores? OR What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?	2
24	 <p>(a) The figure shows a domestic electric circuit. Study this circuit carefully and list any two errors in the circuit and justify your answer. (b) Give one difference between the wires used in the element of an electric heater and in a fuse.</p> <p>OR</p> <p>The diagram shows a current carrying loop passing through a cardboard sheet.</p>  <p>(a) Draw the pattern and direction of magnetic field lines on the board. (b) State the rule used to find out the direction of magnetic field lines.</p>	2
25	A piece of wire of resistance $6\ \Omega$ is connected to battery of $12\ \text{V}$. Find the amount of current flowing through it. Now, the same wire is redrawn by stretching it to double its length. Find the resistance of the new wire.	2
26	What are decomposers? What will be the consequence of their absence in an ecosystem?	2
Section-C Question No. 27 to 33 are short answer questions		
27	(a) Name a compound which is prepared from gypsum has the property of hardening when mixed with proper quantity of water. (b) Write its preparation and chemical formula. (c) Mention two of its uses.	3
28	(a) Show diagrammatically the electrons between the atoms in the formation of CaF_2 . Write symbols of cation and anion present in CaF_2 . (b) Why are aqueous solution of ionic compounds able to conduct electricity? OR Write balanced equation for the reactions taking place when (a) Zinc carbonate is calcinated. (b) Cinnabar is heated in the air. (c) Manganese dioxide is heated with aluminium powder.	3
29	An old man is advised by his doctor to take less sugar in his diet.	3

	<p>(a) Name the disease from which the man is suffering.</p> <p>(b) Mention the hormone due to the imbalance of which he is suffering from this disease.</p> <p>(c) Which endocrine gland secretes this hormone?</p>	
30	<p>We often hear people complain about acidity in the stomach.</p> <p>(a) Overproduction of which substance is most likely to be the reason for the complaint</p> <p>(b) Why is the production of this substance necessary?</p> <p>(c) How does the stomach prevent itself from the harmful effects of overproduction of the substance?</p>	3
31	<p>(a) A stationary charge is placed in a magnetic field. Will it experience a force? Give reason to justify your answer.</p> <p>(b) On what factors does the direction of force experienced by a current carrying conductor placed in a uniform magnetic field depend.</p> <p>(c) A proton enters into a uniform magnetic field as shown in figure given below. What is the direction of magnetic force acting on the proton.</p> 	3
32	<p>(a) State the law of refraction of light that defines the refractive index of a medium with respect to the other.</p> <p>(b) Absolute refractive indices of two media P and Q are 1.33 (n_P) and 2.42 (n_Q) respectively. The speed of light in medium P is 2.25×10^8 m/s.</p> <p>(i) What would be the speed of light in medium Q (v_Q)?</p> <p>(ii) For the same angle of incidence of 45°, the refractive angle in two transparent media P and Q is 32° and 17° respectively. Which of the two is optically denser and why?</p>	3
33	<p>Rahul passed a beam of white light through a series of equilateral prisms as shown.</p>  <p>(a) What colour(s) will be seen on the screen?</p> <p>(b) Copy the diagram above and draw the beam entering Prism 1 and emerging from Prism 3 and falling on the screen.</p> <p>(c) Name all the processes that take place when the beam of light enters the Prism 1 and emerges from Prism 3.</p>	3
<p>Section-D</p> <p>Question No. 34 to 36 are long answer questions.</p>		
34	<p>A compound C (molecular formula, $C_2H_4O_2$) reacts with Na metal to form a compound R and evolves into a gas which burns with a pop sound. Compound C on treatment with an alcohol A in the presence of an acid forms a sweet-smelling compound S (molecular formula, $C_3H_6O_2$). On addition of NaOH to C, it also gives R and water. S on treatment with NaOH solution gives back R and A.</p>	5

	<p>Identify C, R, A, and S and write down the reactions involved.</p> <p style="text-align: center;">OR</p> <p>(a) Explain the given reactions with the examples (i) Substitution reaction (ii) Esterification (iii) Combustion of LPG</p> <p>(b) (i) Write the IUPAC name for the following:</p> <div style="text-align: center;">  and  </div> <p>(ii) Draw the structures for the following: 3-Chlorobutanol and Hex-3-yne.</p>													
35	<p>(a) Describe the role of testis, prostate gland and seminal vesicle in the human male reproductive system.</p> <p>(b) How is the surgical removal of unwanted pregnancies misused?</p> <p>(c) Suggest why mechanical contraceptive methods are preferred over oral contraceptive methods.</p> <p style="text-align: center;">OR</p> <p>(a) Differentiate between cranial and spinal nerves.</p> <p>(b) How does nervous tissue cause muscular action?</p> <p>(c) With the help of an example, explain feedback mechanism of hormones.</p>	5												
36	<p>A student focussed the image of an object on a white screen using a converging lens. He noted down the positions of the object, screen and the lens on a scale as given below: Position of object = 10.0 cm; Position of lens = 50.0 cm; Position of screen = 90.0 cm</p> <p>(a) Find the focal length and power of the converging lens.</p> <p>(b) Find the position of the image if the object is shifted towards the lens at a position of 30.0 cm.</p> <p>(c) Draw a ray diagram to show the nature of the image formed if the object is further shifted towards the lens.</p> <p style="text-align: center;">OR</p> <p>(a) If the image formed by a mirror for all positions of the object placed in front of it is always diminished, erect and virtual, state the type of the mirror and also draw a ray diagram to justify your answer.</p> <p>(b) Write one practical application of a convex mirror?</p> <p>(c) Rohit placed a pencil perpendicular to the principal axis in front of a converging mirror of focal length 30 cm. The image formed on the screen is twice the size of the pencil. Calculate the distance of the object from the mirror. Draw a ray diagram to justify your answer.</p>	5												
	<p>Section - E</p> <p>Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.</p>													
37	<p>The table shows some information about compounds in homologous series.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Name of the compound</th> <th>Molecular formula</th> <th>Molecular mass</th> <th>Boiling point</th> </tr> </thead> <tbody> <tr> <td>Methanoic acid</td> <td>HCOOH</td> <td>46</td> <td>100.8°C</td> </tr> <tr> <td>Ethanoic acid</td> <td>CH₃COOH</td> <td>60</td> <td>118°C</td> </tr> </tbody> </table>	Name of the compound	Molecular formula	Molecular mass	Boiling point	Methanoic acid	HCOOH	46	100.8°C	Ethanoic acid	CH ₃ COOH	60	118°C	4
Name of the compound	Molecular formula	Molecular mass	Boiling point											
Methanoic acid	HCOOH	46	100.8°C											
Ethanoic acid	CH ₃ COOH	60	118°C											

	<p>Carboxylic acid, any of a class of organic compounds in which a carbon atom is bonded to an oxygen atom by a double bond and to a hydroxyl group by a single bond. They are generally more acidic than other organic compounds containing hydroxyl groups but are generally weaker than mineral acids such as hydrochloric acid.</p> <p>(a) Predict the molecular mass of the compound in same series which has six carbon atoms in one molecule. Write the general formula for a compound in this homologous series.</p> <p>(b) How to distinguish ethanoic acid from ethanol? Why ethanoic acid is called glacial acetic acid?</p> <p style="text-align: center;">OR</p> <p>(b) Draw the electron dot structure of H₂S and propanoic acid.</p>	
38	<p>A student performed an experiment to study the inheritance pattern of genes. He crossed pea plants bearing Inflated pods (II) with pea plants bearing constricted pods (ii) and obtained plants with all inflated pods in F₁ generation.</p> <p>(a) What set of genes will be present in the F₁ generation?</p> <p>(b) Give reason, why only plants bearing inflated pods are observed in F₁ progeny.</p> <p>(c) Work out the probabilities of the off-springs when heterozygous (inflated) hybrids of F₁ generation are self- pollinated and calculate the percentage of these would be pure inflated and pure constricted?</p> <p style="text-align: center;">OR</p> <p>(c) How does the cross between pea plants bearing inflated pods (II) with pea plants bearing constricted pods (ii). Show that traits may be dominant or recessive.</p>	4
39	<p>In the series combination, the resistances are joined end to end. For a series combination of resistors, $R_s = R_1 + R_2 + R_3 + \dots$ and current through each resistor is same but their potential difference between their ends are different according to their resistance. . In the parallel combination, two or more resistors are combined in such a way that their first ends are connected to one point and the second ends to another point. In a parallel combination of resistors, $1/R_p = 1/R_1 + 1/R_2 + \dots$ and potential drop across each resistor is same but current in different resistances are different.</p> <p>(a) If we connect n bulbs each with a rated power P in parallel, what is the total power consumed by the combination at rated voltage?</p> <p>(b) If resistors $4\Omega, 5\Omega$ and 6Ω are connected in series with $5V$ battery, calculate the total power consumed by the combination.</p> <p>(c) In the circuit given below the resistance of the path $xTy = 2\Omega$ and that $xZy = 6\Omega$. Calculate the current that flows through the path xTy and xZy.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">OR</p> <p>(c) Draw a schematic diagram of a circuit consisting of a battery of three cells of $2V$ each, a combination of three resistors of $10\Omega, 20\Omega$ and 30Ω connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the total current in the circuit.</p>	4

