No of Printed Pages: 07

INDIAN SCHOOL SOHAR
PRE - BOARD I EXAMINATION (2023-24)
SCIENCE THEORY (086)
SET-1

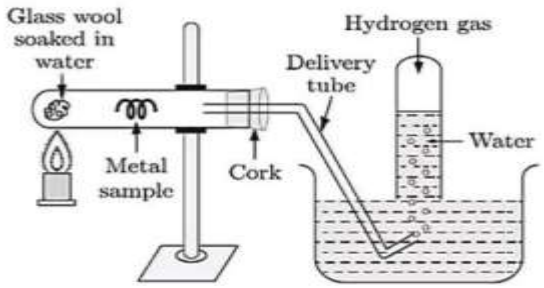
CLASS: X **MAX. MARKS: 80**
DATE: 10/01/2024 **TIME: 3 HOURS**

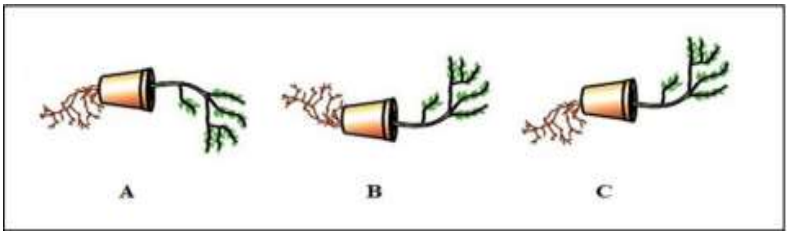
General Instructions:

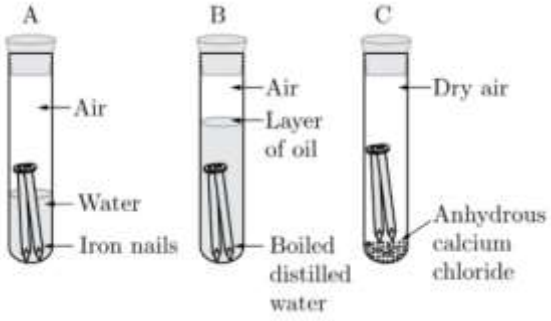
i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 objective type questions carrying 1 mark each.
iv. Section 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.
v. 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.
vi. 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.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

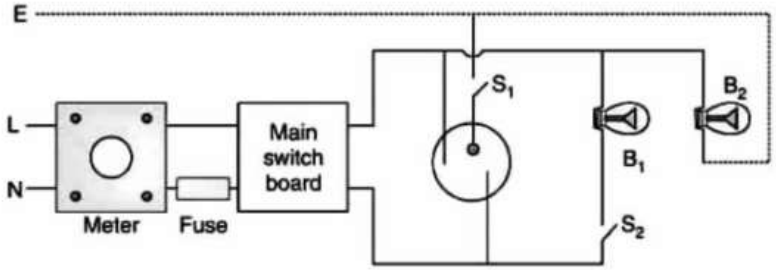
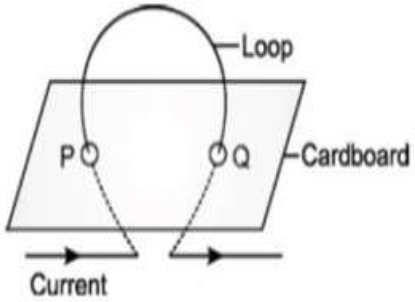
Section-A

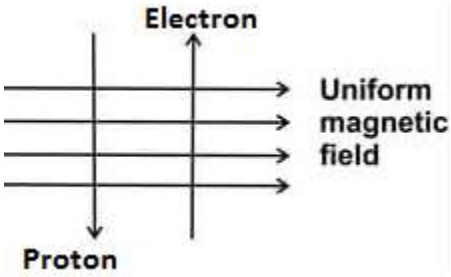
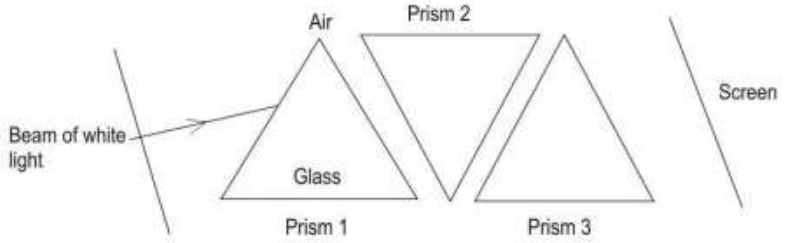
Select and write the most appropriate option out of the four options given for each of the questions 1 -20.

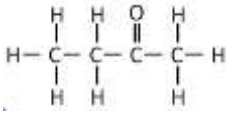
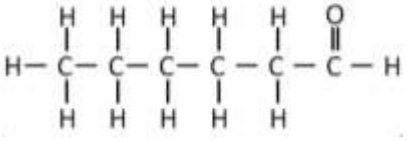
1	Which of the following oxide(s) of iron would be obtained on prolonged reaction of iron with steam?  (a) FeO (b) Fe_2O_3 (c) Fe_3O_4 (d) Fe_2O_3 and Fe_3O_4	1
2	Which of the following reaction is characterised by the yellow colour of product? (a) $2Pb_3O_4 \rightarrow 6PbO(s) + O_2(g)$ (b) $Zn(s) + H_2SO_4 \rightarrow ZnSO_4 + H_2$ (c) $Na_2CO_3 + H_2SO_4 \rightarrow Na_2SO_4 + H_2O + CO_2$ (d) $2KClO_3 \rightarrow 2KCl + 3O_2(g)$	1
3	Which of the following substance will not give carbon dioxide on treatment with dilute acid? (a) Marble (b) Lime water (c) Limestone (d)Baking soda	1
4	During purification of a metal by electrolysis, what happens at the negative electrode? (a) Metal ions lose electrons to become neutral atoms. (b) Neutral metal atoms gain electrons to become ions. (c) Neutral metal atoms lose electrons to become ions. (d) Metal ions gain electrons to become neutral metal atoms.	1

5	An element with atomic number _____ will form a basic oxide. (a) 7(2,5) (b) 17(2,8,7) (c) 14(2,8,4) (d) 11(2,8,1)	1
6	In one of the industrial processes used for manufacture of sodium hydroxide, a gas X is formed as by-product. The gas reacts with lime water to give a compound Y which is used as a bleaching agent in chemical industry. The compound X and Y could be: (a) CO_2 and $CaOCl_2$ (b) H_2 and $NaHCO_3$ (c) Cl_2 and $NaHCO_3$ (d) Cl_2 and $CaOCl_2$	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	If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected? (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.	1
9	A potted plant is placed horizontally on the ground. Observe the three figures given below. Which of the following depicts tropic movements appropriately?  (a) B and C (b) A and C (c) B only (d) C only	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	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
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 series 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 (c) Brightness of bulb B will be more than that of A (d) Brightness of bulb C will be the maximum	1
14	A real image is formed by the light rays after reflection or refraction when they: (i) actually meet or intersect with each other.	1

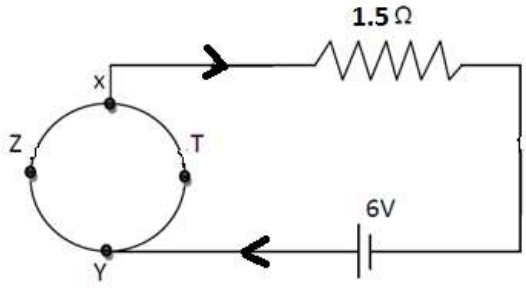
	(ii) actually converge to a point. (iii) appear to meet when they are produced in the backward direction. (iv) appear to diverge from a point. Which of the above statements are correct? (a) i and iv (b)ii and iv (c) i and ii (d) ii and iii	
15	Which of the following limits the number of trophic levels 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 **:** White silver chloride turns grey in sunlight. Reason : Decomposition of silver chloride in presence of sunlight takes place to form silver metal and chlorine gas.	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. What is the number of chromosomes in the female gamete? 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	 (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. **OR** The diagram shows a current carrying loop passing through a cardboard sheet.  (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.	2
25	A piece of wire of resistance 6 Ω is connected to battery of 12 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 a 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 solutions of ionic compounds able to conduct electricity? **OR** (a) Metals are electropositive in nature. Why? (b) Why does calcium start to float when it reacts with water? Write the balanced chemical equation of the reaction.	3
29	An old man is advised by his doctor to take less sugar in his diet. (a) Name the disease from which the man is suffering.	3

	(b) Mention the hormone due to the imbalance of which he is suffering from this disease. (c) Which endocrine gland secretes this hormone?	
30	(a) Bile juice does not contain any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement. (b) Mention the part where bile juice is temporarily stored.	3
31	(a) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed. (b) State the purpose of the soft iron core used in making an electromagnet. (c) A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure given below . In the field an electron and a proton move as shown. What is the direction of magnetic force acting on the proton and electron. 	3
32	Rahul passed a beam of white light through a series of equilateral prisms as shown.  (a) What colour(s) will be seen on the screen? (b) Copy the diagram above and draw the beam entering Prism 1 and emerging from Prism 3 and falling on the screen. (c) Name all the processes that take place when the beam of light enters the Prism 1 and emerges from Prism 3.	3
33	(a) State the law of refraction of light that defines the refractive index of a medium with respect to the other. (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 x 10^8 m/s. (i) What would be the speed of light in medium Q (V_Q)? (ii) If the angle of incidence for a ray of light travelling from medium P to Q is 0°, then what will be the path of ray of light in the medium Q . Give justification for your answer.	3
	Section-D Question No. 34 to 36 are long answer questions.	
34	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. Identify **C, R, A**, and **S** and write down the reactions involved. **OR**	5

	(a) Explain the given reactions with the examples. (i) Hydrogenation reaction (ii) Oxidation reaction of propanol. (iii) Saponification reaction (b) (i) Write the IUPAC name for the following:  and  (ii) Draw the structures for the following: (a) 3-Chlorobutanol (b) Hex-3-yne.	
35	(a) Describe the role of testis, prostate gland and seminal vesicle in the human male reproductive system. (b) How is the surgical removal of unwanted pregnancies misused? (c) Suggest why mechanical contraceptive methods are preferred over oral contraceptive methods. **OR** (a) Differentiate between cranial and spinal nerves. (b) How does nervous tissue cause muscular action? With the help of an example, explain feedback mechanism of hormones.	5
36	A student focused 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 (a) Find the focal length and power of the converging lens. (b) Find the position of the image if the object is shifted towards the lens at a position of 30.0 cm. (c) Draw a ray diagram to show the nature of the image formed if the object is further shifted towards the lens. **OR** (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. (b)Write one practical application of a convex mirror? (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.	5
	Section - E 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.	
37	The table shows some information about compounds in homologous series.	4

Name of the compound	**Molecular formula**	**Molecular mass**	**Boiling point**
Methanoic acid	**HCOOH**	**46**	**100.8'C**
Ethanoic acid	**CH_3COOH**	**60**	**118'C**

	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. (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. (b) How to distinguish ethanoic acid from ethanol? Why ethanoic acid is called glacial acetic acid? **OR** (b) Draw the electron dot structure of H_2S and propanoic acid.	
38	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. (a) What set of genes will be present in the F1 generation? (b) Give reason, why only plants bearing inflated pods are observed in F1 progeny. (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? **OR** (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.	4
39	In the series combination, the resistances are joined end to end. For a series combination of resistors, $R_s = R_{1+}R_2+R_3+$…….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, $1/R_p=1/R_1+1/R_2+$… and potential drop across each resistor is same but current in different resistances are different. (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? (b) If resistors 4Ω,5Ω and 6Ω are connected in series with 5V battery, calculate the total power consumed by the combination. (c) In the circuit given below the resistance of the path xTy = 2 Ω and that xZy = 6 Ω. Calculate the current that flows through the path xTy and xZy.  **OR** (c)Draw a schematic diagram of a circuit consisting of a battery of three cells of 2V each, a combination of three resistors of 10Ω,20Ω 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.	4