



INDIAN SCHOOL SOHAR  
PERIODIC TEST III(2023-24)  
SCIENCE THEORY (086)  
SET-2

No of Printed Pages: 06

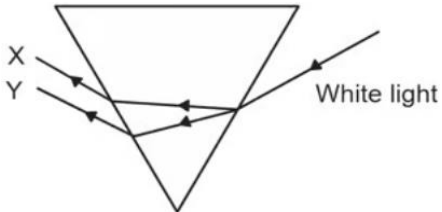
CLASS: X  
DATE: 20/11/2023

Max Marks: 80  
Time: 3 hours

**General Instructions:**

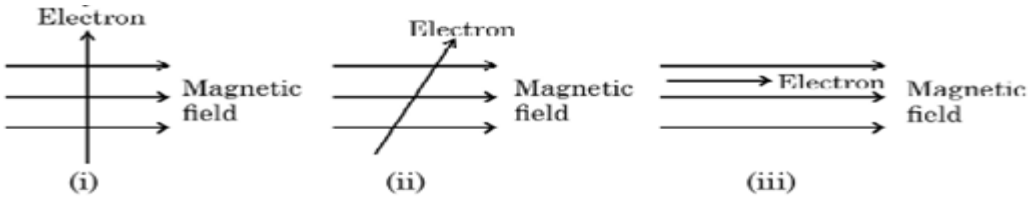
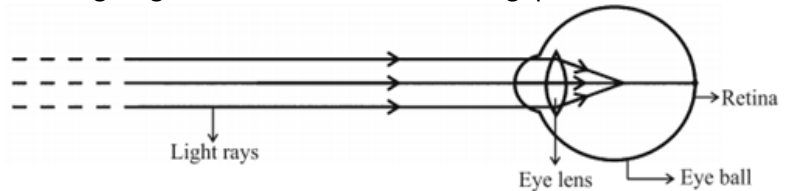
- This question paper consists of **39** questions in **5** sections.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section **A** consists of **20** objective type questions carrying **1 mark** each.
- Section **B** consists of **6** Very Short questions carrying **02 marks** each.
- Section **C** consists of **7** Short Answer type questions carrying **03 marks** each.
- Section **D** consists of **3** Long Answer type questions carrying **05 marks** each.
- 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 one of the following four metals would be displaced from the solution of its salts by the other three metals? a) Mg                                      b) Ag                                      c) Zn                                      d) Cu	1
2	What is the chemical formula of POP (Plaster of Paris)? a) $\text{CaSO}_4$ b) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ c) $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$ d) $\text{CaSO}_4 \cdot \text{H}_2\text{O}$	1
3	The soap molecule has a (a) hydrophilic head and a hydrophobic tail                                      (b) hydrophobic head and a hydrophilic tail (c) hydrophobic head and a hydrophobic tail                                      (d) hydrophilic head and a hydrophilic tail.	1
4	$\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$ Identify the substance oxidized in the above equation. (a) $\text{MnCl}_2$ (b) $\text{HCl}$ (c) $\text{H}_2\text{O}$ (d) $\text{MnO}_2$	1
5	An electrolytic cell consists of (i) positively charged cathode                                      (ii) negatively charged anode (iii) positively charged anode                                      (iv) negatively charged cathode (a) (i) and (ii)                                      (b) (iii) and (iv)                                      (c) (i) and (iii)                                      (d) (ii) and (iv)	1
6	Which one of the following is an example of oxidation? (a) $2\text{Mg} + \text{O}_2 \xrightarrow{\text{Burning}} 2\text{MgO}(\text{s})$ (b) $\text{CuO}(\text{s}) + \text{H}_2(\text{g}) \xrightarrow{\text{Heat}} \text{Cu}(\text{s}) + \text{H}_2\text{O}(\text{g})$ (c) $\text{Fe}_2\text{O}_3(\text{s}) + 2\text{Al}(\text{s}) \rightarrow \text{Al}_2\text{O}_3(\text{s}) + 2\text{Fe}(\text{s})$ (d) None of these	1
7	Sodium carbonate is a basic salt because it is a salt of (a) strong acid and strong base                                      (b) weak acid and weak base (c) strong acid and weak base                                      (d) weak acid and strong base	1
8	The enzymes trypsin and lipase help in digesting: (a) Starch and Lipids                                      (b) Proteins and Fats (c) Proteins and Carbohydrates                                      (d) Fats and Proteins	1
9	Which of the following is called the thinking part of the brain? (a) Cerebrum                                      (b) Cerebellum                                      (c) Medulla                                      (d) Pons	1

10	Vegetative propagation refers to formation of new plants from: (a) roots, stem and flowers (b) stem, flowers and seeds (c) seeds, leaves and flowers (d) leaves, stem and root	1
11	The number of chromosomes in a sperm is: (a) 46 (b) 23 pairs (c) 23 (d) 22 pairs	1
12	What are the products obtained by anaerobic respiration in yeasts? (a) Lactic acid + Energy (b) Carbon dioxide + Water + Energy (c) Pyruvate + Water + Energy (d) Ethanol + Carbon dioxide + Energy	1
13	Work of 14 J is done to move 2 C charges between two points on a conducting wire. What is the potential difference between the two points? (a) 28 V (b) 14 V (c) 7 V (d) 3.5 V	1
14	In the diagram given below, X and Y are the end colours of the spectrum of white light. The colour of 'Y' represents the    (a) Colour of sky as seen from earth during the day. (b) Colour of the sky as seen from the moon. (c) Colour used to paint the danger signals. (d) Colour of sun at the time of noon	1
15	If a grasshopper is eaten by frog, then the energy transfer here is said to be from: (a) producer to primary consumer (b) primary consumer to secondary consumer (c) secondary consumer to primary consumer (d) consumer to decomposer	1
16	Which of the following groups contain only biodegradable items? a) wood, leather, grass b) plastic, DDT, PVC c) paper, glass, leather d) PVC, grass, DDT	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 HCl is added to zinc granules, a chemical reaction occurs. Reason: The evolution of a gas and change in colour indicate that a chemical the reaction is taking place.	1
18	Assertion: Probability of variations is more in sexual reproduction. Reason: Meiosis occurs during sex cell formation.	1
19	Assertion: A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the magnitude of the current in the wire is increased. Reason : The strength of a magnetic field at a point near the conductor increases on increasing the current	1
20	Assertion: Bio magnification leads to maximum accumulation of chemicals at the first trophic level. Reason: Producers can convert inorganic raw materials into organic substances.	1

**Section-B**

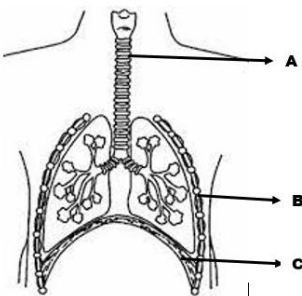
Question No. 21 to 26 are very short answer questions

21	Metal oxides are basic in nature. But some metal oxides show both acidic as well as basic behaviour. What are these oxides called? Name one such oxide and write the reaction with an acid and a base.	2
22	State any two advantages of artificial vegetative propagation.	2
23	Give any two structural differences between an artery and a vein. <b>OR</b> What is the significance of septa and valves in circulation?	2
24	<p>a) Name the rule used to find the force acting on a current carrying conductor placed in a magnetic field.</p> <p>b) Given below are three diagrams showing the entry of an electron in a magnetic field. Identify the case in which the force will be (i) maximum and (ii) minimum respectively. Give reason for your answer.</p> <div style="text-align: center;">  </div> <p><b>OR</b></p> <p>a) Draw the pattern of magnetic field lines of a current carrying solenoid.</p> <p>b) List two distinguishing features between the fields of a current carrying solenoid and bar magnet.</p>	2
25	<p>Observe the following diagram and answer the following questions.</p> <div style="text-align: center;">  </div> <p>a) Identify the defect of vision shown.</p> <p>b) List its two causes.</p> <p>c) Name the type of lens used for the correction of this defect.</p>	2
26	<p>a) Use of paper bags is considered to be eco-friendly than the use of polythene bags. Why?</p> <p>b) In a food chain comprising of frogs, insects, grass and birds- which one of the organisms will have maximum concentration of chemical in its body? Why?</p>	2

**Section-C**

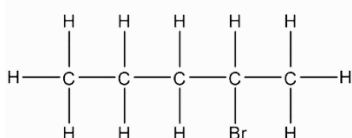
Question No. 27 to 33 are short answer questions

27	<p>Give reasons:</p> <p>(a) Platinum, gold and silver are used to make jewellery.</p> <p>(b) Sodium, potassium and lithium are stored under oil.</p> <p>(c) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.</p> <p align="center"><b>OR</b></p> <p>Give reasons for the following:</p> <p>(a) Ionic compounds in general have high melting and boiling points.</p> <p>(b) Highly reactive metals cannot be obtained from their oxides by heating them with carbon.</p> <p>(c) Copper containers get a green coat when left exposed to air in the rainy season.</p>	3
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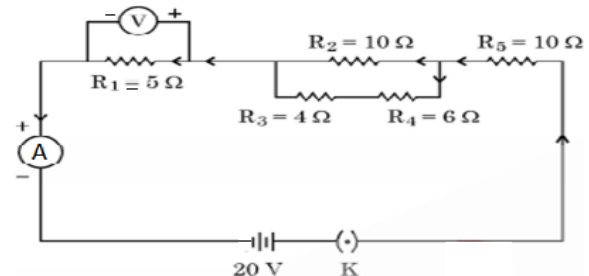
28	a) Draw the structures of possible isomers of pentane. (b) Why is the reaction between methane and chlorine considered a substitution reaction? Explain with chemical reaction.	3
29	(a) Name a growth promoting phytohormone and a hormone that inhibits growth in plants. (b) Briefly explain any two ways by which adrenaline enables the body to deal with an emergency scary situation.	3
30	Observe the diagram given and answer the questions that follow: 	3
31	At what distance from a concave lens of focal length 20cm, can a 6cm tall object be placed so as to obtain its image at 15cm from the lens? Also calculate the size of the image formed. Draw a ray diagram to justify your answer for the above situation and label it.	3
32	The speed of light in glass is $2 \times 10^8$ m/s and in water is $2.25 \times 10^8$ m/s. a) Which one of the two is optically denser and why? b) "A ray of light incident on a rectangular glass slab immersed in any medium emerges parallel to itself". Draw a labelled ray diagram to justify this statement	3
33	a) What is the function of an earth wire? Why is it necessary to earth metallic appliances? b) What is the frequency of AC in India? State one advantage of AC over DC.	3

#### Section-D

Question No. 34 to 36 are long answer questions.

34	Write the chemical reaction for each of the following: Ethanoic acid reacted with sodium bicarbonate. Propene is heated with $H_2$ . Ethanol is heated with ethanoic acid in the presence of conc. $H_2SO_4$ . Give a test to distinguish ethane from ethene. Draw the structure of the following compounds: (a) Ethanoic acid                      (b) Butanone.  <b>OR</b> A neutral organic compound 'A' of molecular formula $C_2H_6O$ on heating with excess of concentrated $H_2SO_4$ gives compound 'B' of molecular formula $C_2H_4$ . 'B' on reduction gives compound 'C' of molecular formula $C_2H_6$ . Name A, B and C Write the chemical equation for the conversion of A to B. What is the role of concentrated $H_2SO_4$ in the above equation? Give the name of an aldehyde derived from propane. Write the IUPAC name of 	5
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35	<p>a) What is the significance of the following parts in sexual reproduction in plants:  i) Pollen grain      ii) Stigma      iii) Ovule</p> <p>b) How is the number of chromosomes and the DNA content in the zygote of sexually reproducing organisms maintained?</p> <p style="text-align: center;"><b>OR</b></p> <p>a) What is the significance of receptors in our body?  b) Differentiate between gustatory and olfactory receptors.  c) How do nervous impulses travel in the body through a synapse?</p>	5
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36	<p>a) State Joule's law of heating. Derive it mathematically when an appliance of resistance R is connected to a source of voltage V and the current I flow through the appliance for a time t.</p> <p>b) Two lamps, one rated 100W at 220V and the other 60W at 220V, are connected in parallel to the electric mains supply of 220V. Draw a circuit diagram to show this arrangement and calculate the current drawn by the two lamps from the mains.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) What are the four factors affecting the resistance of a conductor?  b) Study the following circuit and find:  (i) Effective resistance of the circuit.  (ii) Current drawn from the battery.  (iii) Potential difference across the 5Ω resistor.</p> <div style="text-align: center;">  </div>	5
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**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	<p>When a silvery grey powder of a solid <b>(A)</b> is mixed with a powder of solid <b>(B)</b> no reaction occurs. But if the mixture is ignited and lighted using a magnesium ribbon a reaction occurs with the evolution of a large amount of heat forming product <b>(C)</b> which settles down as liquid metal and the solid product <b>(D)</b> formed floats on the liquid <b>(C)</b>. <b>(C)</b> in solid form reacts with moisture to form rust. The amount of heat generated during the reaction is so high that the reaction is used in welding of electric conductors, and joints in railway tracks.</p> <p>a) Write the balanced chemical equation for the reaction.  b) Write the name of the compounds.  c) If (A) reacts with air on heating what will be the nature of the oxide formed? Give a chemical equation.</p> <p style="text-align: center;"><b>OR</b></p> <p>c) Name and Define the type of the reaction.</p>	4
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38	<p>Refer to the table regarding results of F2 generation of Mendelian cross.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Phenotypes</th> <th style="text-align: left;">Number of plants</th> </tr> </thead> <tbody> <tr> <td>Plants with round and yellow coloured seeds</td> <td>563</td> </tr> <tr> <td>Plants with round and green coloured seeds</td> <td>188</td> </tr> <tr> <td>Plants with wrinkled and yellow coloured seeds</td> <td>187</td> </tr> <tr> <td>Plants with wrinkled and green coloured seeds</td> <td>62</td> </tr> </tbody> </table>	Phenotypes	Number of plants	Plants with round and yellow coloured seeds	563	Plants with round and green coloured seeds	188	Plants with wrinkled and yellow coloured seeds	187	Plants with wrinkled and green coloured seeds	62	
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Plants with wrinkled and green coloured seeds	62											

On the basis of the above data answer the following questions.

- a) Which of the characteristics appear to be dominant in the above cross?
- b) Is the inheritance of the shape and colour of seed linked? Give reason for your answer.
- c) Write the genotypes of each of the above given phenotypes.

**OR**

c) A farmer decides to pollinate one flower of a plant with round and green coloured seeds using pollen from plant with wrinkled and yellow coloured seeds. What will be the phenotypes of the new generation obtained?

4

39 A student took three concave mirrors of different focal lengths and performed the experiment to see the image formation by placing an object at different distances with these mirrors as shown in the following table:

Case No.	Object-distance	Focal length
I	45 cm	20 cm
II	30 cm	15 cm
III	20 cm	30 cm

Now answer the following questions.

- a) List two properties of the image formed in case I.
- b) In which one of the cases given in the table, the mirror will form a real image of the same size and why?
- c) In one of the cases given in the table, the mirror will form a virtual image. Calculate the distance of the image from the mirror in this case.

**OR**

c) Look at the table and identify the situation (object distance and focal length) which resembles the situation in which concave mirrors are used as shaving mirrors? Draw a ray diagram to show the image formation in this case and write the characteristics of the image formed.

4