



INDIAN SCHOOL SOHAR  
PERIODIC TEST III (2023-24)  
SCIENCE THEORY (086)  
SET-1

No of Printed Pages: 06

CLASS: X  
DATE: 20/11/2023

Max Marks: 80  
Time: 3 hours

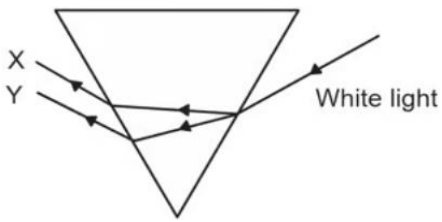
**General Instructions:**

- 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	<p>Test tubes A, B and C contain zinc sulphate, silver nitrate and iron (II) sulphate solutions respectively as shown in the figure. Copper pieces are added to each test tube. The blue colour will appear in case of :</p> <div style="text-align: center;"><p>Zinc sulphate solution      Silver nitrate solution      Iron(II) sulphate solution</p><p>A      B      C</p><p>Copper piece</p></div> <p>(a) Test tube A      (b) Test tube B      (c) Test tube C      (d) All the test tube</p>	1
2	<p>The correct electron dot structure of a water molecule is</p> <p>(a) <math>\text{H} \cdot \ddot{\text{O}} \cdot \text{H}</math>      (b) <math>\text{H} : \ddot{\text{O}} \cdot \text{H}</math>      (c) <math>\text{H} : \ddot{\text{O}} : \text{H}</math>      (d) <math>\text{H} : \text{O} : \text{H}</math></p>	1
3	<p>A student was given four unknown colorless samples labelled A, B, C and D and asked to test their pH with pH paper he observed the following colour changes:</p> <p>A. light green      B. dark red      C. light orange      D. dark blue</p> <p>The correct sequence of increasing order of pH sample is:</p> <p>(a) <math>A &lt; B &lt; C &lt; D</math>      (b) <math>A &lt; D &lt; C &lt; B</math>      (c) <math>C &lt; B &lt; A &lt; D</math>      (d) <math>B &lt; C &lt; A &lt; D</math></p>	1
4	<p>At what temperature is gypsum heated to form Plaster of Paris?</p> <p>(a) <math>90^\circ\text{C}</math>      (b) <math>100^\circ\text{C}</math>      (c) <math>110^\circ\text{C}</math>      (d) <math>120^\circ\text{C}</math></p>	1
5	<p>The reaction <math>2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}</math> is an example of</p> <p>(a) combination reaction      (b) decomposition reaction (c) displacement reaction      (d) double displacement reaction</p>	1

6	A metal M of moderate reactivity is present as its sulphide X. On heating in air, X converts into its oxide Y and a gas evolves. On heating Y and X together, the metal M is produced. X and Y respectively are (a) X- copper(I) sulphide, Y- copper(I) oxide (b) X- copper(I) sulphide, Y- copper (II) oxide (c) X- sodium sulphide, Y- sodium oxide (d) X- calcium sulphide, Y- calcium oxide	1
7	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)	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 activities given below is not controlled by the medulla? i) Coughing ii) Vomiting iii) Memory iv) Hearing (a) i and ii (b) ii and iii (c) iii and iv (d) i and iv	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 non-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: Precipitation reactions produce insoluble salts. Reason: Precipitation reaction is a double decomposition reaction.	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

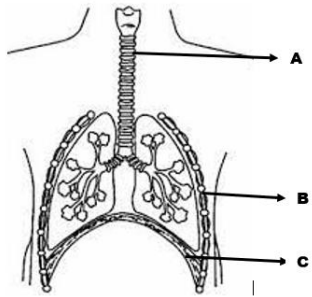
**Section-B**

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 differences between the blood composition of renal artery and renal vein. <b>OR</b> Why is circulation in humans called closed double 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
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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.                  b) List its two causes.                  c) Name the type of lens used for the correction of this defect.</p>	2
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26	a) Use of paper bags is considered to be eco-friendly than the use of polythene bags. Why? 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?	2
<b>Section-C</b> Question No. 27 to 33 are short answer questions		
27	Soaps and detergents are both types of salts. State any one difference between the two. Write the mechanism of the cleansing action of soaps. Why do soaps not form lather (foam) with hard water?	3
28	Give reasons for the following: (a) Ionic compounds in general have high melting and boiling points. (b) Highly reactive metals cannot be obtained from their oxides by heating them with carbon. (c) Copper containers get a green coat when left exposed to air in the rainy season. <b>OR</b> Give reasons: (a) Platinum, gold and silver are used to make jewellery. (b) Sodium, potassium and lithium are stored under oil. (c) Carbonate and sulphide ores are usually converted into oxides during the process of extraction.	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:  a) How does part labelled A stand erect even there is no air in it? b) What are the changes that happen to parts labelled B and C at the time of inhalation?	3
31	A student has focused the image of a candle flame on a white screen using a convex lens. The situation is as given below: Length of the flame = 2cm      Focal length of the lens = 12cm Distance of the flame from the lens = 16cm If the flame is perpendicular to the principal axis of the lens, a) Calculate the values of the following: (i) Distance of the image from the lens (ii) Length of the image formed b) Draw a ray diagram to show the formation of the image in this case.	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.

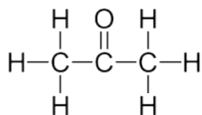
34 An organic compound A is widely used as a pickle preservative and has molecular formula  $C_2H_4O_2$ . This compound reacts with ethanol to form a sweet-smelling compound B.

- Identify the compound A.
- Write the chemical equation for its reaction with ethanol to form B.
- How can we get compound A back from compound B?
- Name the process and the chemical equation for the conversion of B to A.
- Which gas is produced when compound A reacts with washing soda? Write the chemical equation.

5

**OR**

- Give a chemical test to differentiate between ethanol and ethanoic acid.
- Complete the following reaction-
  - $C_2H_5OH + O_2 \xrightarrow{\text{alk. KMnO}_4}$
  - $CH_4 + Cl_2 \xrightarrow{\text{sunlight}}$
- Write the chemical formula of the next homologue of propanol and butyne.
- Write the IUPAC name of



35 a) What is the significance of the following parts in sexual reproduction in plants:  
 i) Pollen grain      ii) Stigma      iii) Ovule  
 b) How is the number of chromosomes and the DNA content in the zygote of sexually reproducing organisms maintained?

5

**OR**

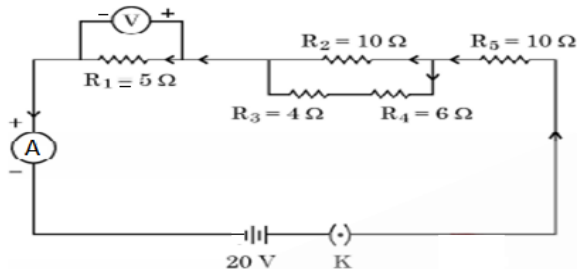
- What is the significance of receptors in our body?
- Differentiate between gustatory and olfactory receptors.
- How do nervous impulses travel in the body through a synapse?

36 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.  
 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.

**OR**

- What are the four factors affecting the resistance of a conductor?
- Study the following circuit and find:
  - Effective resistance of the circuit.
  - Current drawn from the battery.
  - Potential difference across the  $5\Omega$  resistor.

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 A student was asked to purify a sample of copper extracted by a suitable method. He constructed a cell in which a rod of impure copper was made as a cathode while that of pure copper was as an anode. The electrolyte was an aqueous  $\text{CuSO}_4$  solution. On passing electric current nothing happened.
- He realized his mistake and connected the electrodes in the reverse order. He was now quite successful in his mission.
- a) How did he rectify his mistake?  
b) What is this process called? Name one element other than copper which can be refined through this method.

4

**OR**

b) Write a chemical equation for the reaction

- 38 Refer to the table regarding results of F<sub>2</sub> generation of Mendelian cross.

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

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.

4

**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?

- 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.

4

**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.

