

**Directorate of Education, GNCT of Delhi**  
**Practice Paper (Session: 2023-24)**  
**Class: X Subject: SCIENCE**

**Duration: 3 Hrs**

**Maximum Marks:80**

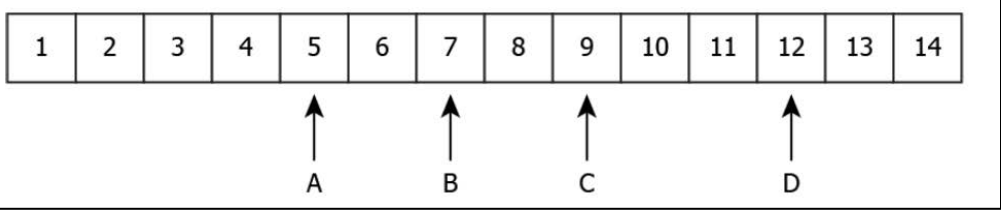
**General Instructions:**

- 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. There is no negative mark for incorrect response.

Q. Nos	Questions	Marks
1	A student wrote a chemical equation of the reaction between carbon monoxide and hydrogen as, $\text{CO}_2 + 2\text{H}_2 \rightarrow \text{CH}_3\text{OH}$ How can the reaction be classified? (a) The reaction is an example of a combination reaction as a compound separates into two compounds. (b) The reaction is an example of a decomposition reaction as a compound dissociates into two compounds. (c) The reaction is an example of a combination reaction as two compounds react to form a single compound. (d) The reaction is an example of a decomposition reaction as two compounds react to form a single compound.	1
2	Which of the following can undergo a chemical reaction? (a) $\text{MgSO}_4 + \text{Fe}$ (b) $\text{ZnSO}_4 + \text{Fe}$ (c) $\text{MgSO}_4 + \text{Pb}$ (d) $\text{CuSO}_4 + \text{Fe}$	1

3	<p>The image shows the pH values of four solutions on a pH scale.</p>  <p>Which solutions are alkaline in nature?          (a) A and B      (b) B and C      (c) C and D      (d) A and D</p>	1
4	<p>When calcium oxide is added to water, it completely dissolves in water without forming bubbles. What products are formed in this reaction?          (a) Ca and H<sub>2</sub>      (b) Ca and H<sub>2</sub>O<sub>2</sub>      (c) Ca(OH)<sub>2</sub>      (d) CaH<sub>2</sub></p>	1
5	<p>Which salt is acidic in nature?          (a) NH<sub>4</sub>Cl      (b) CH<sub>3</sub>COONH<sub>4</sub>      (c) NaCl      (d) Na<sub>2</sub>CO<sub>3</sub></p>	1
6	<p>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)      (d) (i) and (iv)</p>	1
7	<p>Which of the following salts does not contain water of crystallisation?          (a) Blue vitriol      (b) Baking soda      (c) Washing soda      (d) Gypsum</p>	1
8	<p>Digestion of food starts from which organ of the human digestive system?          (a) Mouth due to the presence of saliva          (b) Oesophagus that moves the food in the gut          (c) Pancreas that releases juices for fat breakdown          (d) Stomach that helps in mixing food with digestive juices</p>	1
9	<p>Which of the following option shows the transport of oxygen to the cell correctly?          (a) Lungs → pulmonary vein → left atrium → left ventricle → aorta → body cells          (b) Lungs → pulmonary vein → right atrium → right ventricle → aorta → body cells          (c) Lungs → pulmonary artery → left atrium → left ventricle → vena cava → body cells          (d) Lungs → pulmonary artery → right atrium → right ventricle → vena cava → body cells</p>	1
10	<p>The opening and closing of the stomatal pore depend upon:          (a) Oxygen      (b) Temperature      (c) Water in the guard cells      (d) Concentration of CO<sub>2</sub></p>	1
11	<p>A zygote which has an X chromosome inherited from the father will develop into a:          (a) boy      (b) girl          (c) X chromosome does not determine the sex of a child      (d) either boy or girl</p>	1

12	The contraction and expansion movement of the walls of the food pipe is called: (a) Translocation      (b) Transpiration      (c) Peristaltic movement      (d) Digestion	1
13	The focal length of a plane mirror is (a) 0      (b) infinite      (c) 25 cm      (d) -25 cm	1
14	Magnification produced by a rearview mirror fitted in vehicles: (a) is less than one      (b) is more than one (c) is equal to one (d) can be more than or less than one, depending upon the position of the object in front of it	1
15	Which of the following constitutes a food chain? (a) Grass, goat and human      (b) Goat, cow and elephant (c) Grass, fish and zebra      (d) Grass, wheat and apple	1
16	Some waste products are listed below: Grass Cutting, Polythene Bag, Plastic Toys, Used Tea Bags, Old Clothes, Paper Straw Which group of waste materials can be classified as non-biodegradable? (a) Plant waste, used tea bags      (b) Polyethene bags, plastic toys (c) Used tea bags, paper straw      (d) Old clothes, broken footwear	1
<p>Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>(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.</p>		
17	Assertion (A) : In a reaction of copper with oxygen, copper serves as a reducing agent. Reason (R) : The substance which gains oxygen in a chemical reaction acts as a reducing agent.	1
18	Assertion(A): Testes lie in penis outside the body. Reason (R) : Sperms require temperature lower than the body temperature for development.	1
19	Assertion(A) : A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire. Reason (R) : Strength of a magnetic field decreases as one moves away from a current carrying conductor	1
20	Assertion: Autotrophs can produce food on its own. Reason: Green plants can absorb 1% energy of sunlight that fall on the leaves.	1
<p><b>Section-B</b></p> <p>Question No. 21 to 26 are very short answer questions</p>		

21	Zinc liberates hydrogen gas when reacted with dilute hydrochloric acid, whereas copper does not. Explain why?	2
22	Why is small intestine in herbivores longer than in carnivores?	2
23	In the process of respiration, state any two functions of alveoli. Or Draw a diagram of human respiratory system and label: Trachea, Bronchi and Diaphragm.	2
24	Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray which is directed towards the principal focus of a convex mirror. Mark on it the angle of incidence and the angle of reflection.	2
25	(a) With the help of labelled ray diagram show the path followed by a narrow beam of monochromatic light when it passes through a glass prism. (b) What would happen if this beam is replaced by a narrow beam of white light? Or Draw a labelled diagram to explain the formation of a rainbow in the sky.	2

26	Why are green plants called producers?	2
<b>Section-C</b>		
Question No. 27 to 33 are short answer questions		
27	State what would happen if: (i) some zinc pieces are placed in blue copper sulphate solution. (ii) some copper pieces are placed in green ferrous sulphate solution. (iii) an iron nail is dipped in a solution of copper sulphate for some time.	3
28	(i) By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound. (ii) Ionic compounds are solids. Give reasons. (iii) With the help of a labelled diagram show the experimental set up of action of steam on a metal. Or (i) Write down the electronic configuration of magnesium and oxygen. (ii) Give two general properties of the compound formed by combination of magnesium and oxygen. (iii) Show the formation of this compound by the transfer of electrons.	3
29	A gland secretes a particular hormone. The deficiency of this hormone in the body causes a particular disease in which the blood sugar level rises. (i) Name the gland and the hormone secreted by it.	3

	(ii) Mention the role played by this hormone. (iii) Name the disease caused due to deficiency of this hormone.	
30	Name the plant Mendel used for his experiment. What type of progeny was obtained by Mendel in F1 and F2 generations when he crossed the tall and short plants? Write the ratio he obtained in F2 generation plants.	3
31	Draw a ray diagram to show the refraction of light through a glass prism. Mark on it (a) the incident ray, (b) the emergent ray and (c) the angle of deviation.	1+2
32	Calculate the resistance of a metal wire of length 2m and area of cross section $1.55 \times 10^{-6} \text{ m}^2$ , if the resistivity of the metal be $2.8 \times 10^{-8} \Omega\text{m}$ .	2+1

33	A wire has a resistance of $16 \Omega$ . It is melted and drawn into a wire of half its original length. Calculate the resistance of the new wire. What is the percentage change in its resistance?	3
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#### Section-D

Question No. 34 to 36 are long answer questions.

34	<p>Why are certain compounds called hydrocarbons? Write the general formula for homologous series of alkanes, alkenes and alkynes and also draw the structure of the first member of each series. Write the name of the reaction that converts alkenes into alkanes and also write a chemical equation to show the necessary conditions for the reaction to occur.</p> <p style="text-align: center;">Or</p> <p>(a) On dropping a small piece of sodium in a test tube containing carbon compound 'X' with molecular formula <math>\text{C}_2\text{H}_6\text{O}</math>, a brisk effervescence is observed and a gas 'Y' is produced. On bringing a burning splinter at the mouth of the test tube the gas evolved burns with a pop sound. Identify 'X' and 'Y'. Also write the chemical equation for the reaction. Write the name and structure of the product formed, when you heat 'X' with excess cone, sulphuric acid.</p> <p>(b) Write three different chemical reactions showing the conversion of ethanoic acid to sodium ethanoate. Write balanced chemical equation in each case. Write the name of the reactants and the products other than ethanoic acid and sodium ethanoate in each case.</p>	5
35	<p>(a) Write one main difference between asexual and sexual mode of reproduction. Which species is likely to have comparatively better chances of survival – the one reproducing asexually or the one reproducing sexually? Give reason to justify your answer.</p> <p>(b) Name the following:</p> <ol style="list-style-type: none"> <li>(i) Thread like non-reproductive structures present in Rhizopus.</li> <li>(ii) 'Blobs' that develop at the tips of the non-reproductive threads in Rhizopus.</li> </ol>	5

36	<p>(a) The linear magnification produced by a spherical mirror is -1. Analysing this value state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw any diagram to justify your answer.</p> <p>(b) Draw ray diagrams for the following cases when a ray of light:</p> <p>(i) passing through centre of curvature of a concave mirror is incident on it.</p> <p>(ii) parallel to principal axis is incident on convex mirror.</p> <p>(iii) is passing through focus of a concave mirror incident on it.</p> <p style="text-align: center;">Or</p> <p>(a) A concave mirror is used for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10 cm from the pole of a concave mirror of focal length 15 cm?</p> <p>(i) Position of the image</p> <p>(ii) Size of the image</p> <p>(iii) Nature of the image</p> <p>Draw a labelled ray diagram to justify your inferences.</p> <p>(b) Mention the types of mirrors used as (i) rear view mirrors, (ii) shaving mirrors. List any one reason to justify your answer in each case.</p>	5
<p><b>SECTION - E</b></p> <p>Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts.</p>		
37	<p>Drishti began her study with the understanding that the change in electric current through a circuit induces the creation of a magnetic field around it. Recognizing that magnetic fields are vector quantities with both magnitude and direction, she delved into the visualization of these fields using magnetic field lines. Drishti learned that these lines exhibit specific characteristics—they originate from the north pole and terminate at the south pole, forming closed curves that serve as visual representations of the strength and direction of the magnetic field.</p> <p>(a) What is the nature of magnetic field lines inside the solenoid?</p> <p>(b) For what right left hand thumb rule is used?</p> <p>(c) What are the properties of magnetic poles?</p> <p style="text-align: center;">Or</p> <p>State the effect of a magnetic field on the path of a moving charged particle.</p>	4

38	<p>A couple does not want have children for few years. They consulted a doctor who advised them barrier method and chemical method of birth control. Yet another couple who already have two children , also consulted doctor for some permanent solution to avoid unwanted pregnancy. Doctor advised them surgical method of birth control.</p> <p>(a) Write any two barrier methods of birth control ?</p> <p>(b) What is the side effect of taking contraceptive pills?</p> <p>(c) How chemical methods prevent pregnancy ?state any two points.</p> <p>Or</p> <p>What could be the reasons(any two) for adopting contraceptive methods ?</p>	4
39	<p>Dev, a passionate student of organic chemistry, delved into the fascinating world of homologous series. His investigation focused on understanding the unique characteristics and properties shared by organic compounds within a homologous series. Dev aimed to unravel the structural similarities and differences among homologous members, which are distinguished by the number of CH<sub>2</sub> units in the main carbon chain.</p> <p>(a) Write any two properties of a homologous series ?</p> <p>(b) What would be the name and formula of the 2nd member of homologous series having general formula C<sub>n</sub>H<sub>2n</sub> + 2 ? What would be the difference between two consecutive members in a homologous series in alkanes in terms of molecular mass and number of atoms of elements ?</p> <p>Or</p> <p>Out of the following, find which compound does not belong to the same homologous series ? CH<sub>4</sub>, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>H<sub>8</sub>.</p> <p>What is the next higher homologue of C<sub>3</sub>H<sub>7</sub>OH? What is its formula and what is it called?</p>	4

DOE, Delhi