



**INDIAN SCHOOL SOHAR**  
**PERIODIC TEST-II (2023-24)**  
**SCIENCE (086)**

No of Printed Pages: 07

**CLASS: X**  
**DATE: 17/09/2023**

**Max Marks: 80**  
**Time: 3 hours**

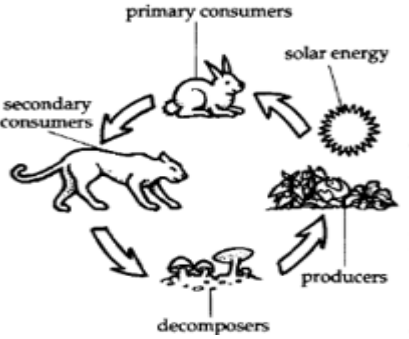
**General Instructions:**

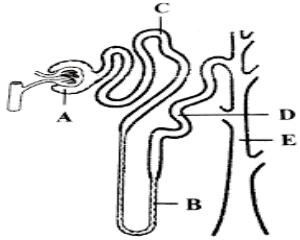
- i) This question paper consists of **39** questions in **5** sections.
- ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii) Section **A** consists of **20** objective type questions carrying **1 mark** each.
- iv) Section **B** consists of **6** Very Short questions carrying **02 marks** each.
- v) Section **C** consists of **7** Short Answer type questions carrying **03 marks** each.
- vi) Section **D** consists of **3** Long Answer type questions carrying **05 marks** each.
- vii) Section **E** consists of **3** source-based/case-based units of assessment of **04 marks** each with sub-parts.

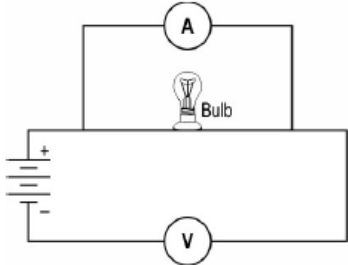
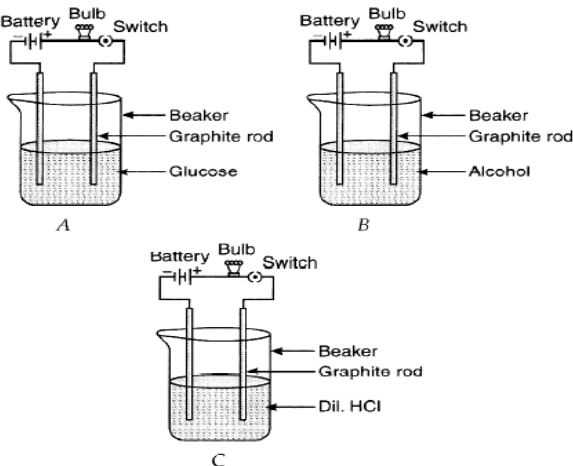
**Section-A**

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

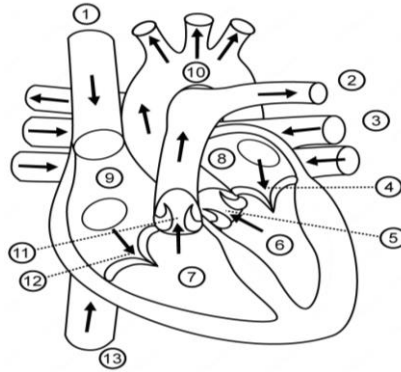
1	<p>Which of the following statements about the given reaction is correct?  <math>3\text{Fe(s)} + 4\text{H}_2\text{O(g)} \rightarrow \text{Fe}_3\text{O}_4\text{(s)} + 4\text{H}_2\text{(g)}</math>            (i) Iron metal is getting oxidized.                      (ii) Water is getting reduced.            (iii) Water is acting as reducing agent.              (iv) Water is acting as oxidizing agent.            a) (i), (ii) &amp; (iv)              b) (iii) &amp; (iv)              c) (i), (ii) &amp; (iii)              d) (ii) &amp; (iv)</p>	1															
2	<p><math>w \text{H}_3\text{PO}_4 + x \text{Mg(OH)}_2 \rightarrow y\text{Mg}_3(\text{PO}_4)_2 + z\text{H}_2\text{O}</math>            For which of the following values of w, x, y and z will the equation above be balanced?            a) w=1, x=3, y=1, z=2                                      b) w=2, x=3, y=1, z=6            c) w=3, x=2, y=1, z=3                                      d) w=3, x=2, y=1, z=6</p>	1															
3	<p>An aqueous solution, 'A', turns phenolphthalein solution pink. In addition to the aqueous solution 'B' to 'A', the pink colour disappears. Which of the following statement is true for solutions 'A' and 'B'?</p> <p>a) A is strongly basic and B is a weak base.              b) A is strongly acidic and B is a weak acid.            c) A has pH less than 7 and B has pH greater than 7.            d) A has pH greater than 7 and B has pH less than 7.</p>	1															
4	<p>Which of the given options correctly represents the Parent acid and base of Calcium Nitrate?</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-left: 20px;"> <thead> <tr> <th style="width: 15%;">Option</th> <th style="width: 35%;">Parent Acid</th> <th style="width: 50%;">Parent Base</th> </tr> </thead> <tbody> <tr> <td>a)</td> <td><math>\text{H}_2\text{SO}_3</math></td> <td>CaO</td> </tr> <tr> <td>b)</td> <td><math>\text{H}_2\text{CO}_3</math></td> <td><math>\text{Ca(HCO}_3)_2</math></td> </tr> <tr> <td>c)</td> <td><math>\text{H}_2\text{SO}_4</math></td> <td><math>\text{Ca(OH)}_2</math></td> </tr> <tr> <td>d)</td> <td><math>\text{HNO}_3</math></td> <td><math>\text{Ca(OH)}_2</math></td> </tr> </tbody> </table>	Option	Parent Acid	Parent Base	a)	$\text{H}_2\text{SO}_3$	CaO	b)	$\text{H}_2\text{CO}_3$	$\text{Ca(HCO}_3)_2$	c)	$\text{H}_2\text{SO}_4$	$\text{Ca(OH)}_2$	d)	$\text{HNO}_3$	$\text{Ca(OH)}_2$	1
Option	Parent Acid	Parent Base															
a)	$\text{H}_2\text{SO}_3$	CaO															
b)	$\text{H}_2\text{CO}_3$	$\text{Ca(HCO}_3)_2$															
c)	$\text{H}_2\text{SO}_4$	$\text{Ca(OH)}_2$															
d)	$\text{HNO}_3$	$\text{Ca(OH)}_2$															
5	<p>An element X reacts with dilute <math>\text{H}_2\text{SO}_4</math> as well as with NaOH to produce salt and Hydrogen gas. Hence, it may be concluded that:</p> <p>(i) X is an electro-positive element                      (ii) oxide of X is basic in nature            (iii) oxide of X is acidic in nature                      (iv) X is an electronegative element.            a) (i) (ii) and (iv)              b) (i), (ii)              c) (i) (ii) and (iii)              d) (ii) (iii) and (iv)</p>	1															

6	<p>The following observations were made by a student on treating four metals, P, Q, R, and S, with the given salt solutions:</p> <table border="1" data-bbox="159 163 1360 363"> <thead> <tr> <th>Sample</th> <th>MgSO<sub>4</sub> (aq)</th> <th>Zn (NO<sub>3</sub>)<sub>2</sub> (aq)</th> <th>CaSO<sub>4</sub> (aq)</th> <th>Na<sub>2</sub>SO<sub>4</sub> (aq)</th> </tr> </thead> <tbody> <tr> <td>P</td> <td>No reaction</td> <td>Reaction occurs</td> <td>Reaction occurs</td> <td>No reaction</td> </tr> <tr> <td>Q</td> <td>Reaction occurs</td> <td>Reaction occurs</td> <td>Reaction occurs</td> <td>Reaction occurs</td> </tr> <tr> <td>R</td> <td>No reaction</td> <td>Reaction occurs</td> <td>No reaction</td> <td>No reaction</td> </tr> <tr> <td>S</td> <td>No reaction</td> <td>No reaction</td> <td>No reaction</td> <td>No reaction</td> </tr> </tbody> </table> <p>Based on the above observation, arrange the given samples in increasing order of reactivity.  a) S &lt; Q &lt; P &lt; R      b) S &lt; R &lt; P &lt; Q      c) P &lt; Q &lt; R &lt; S      d) S &lt; Q &lt; R &lt; P</p>	Sample	MgSO <sub>4</sub> (aq)	Zn (NO <sub>3</sub> ) <sub>2</sub> (aq)	CaSO <sub>4</sub> (aq)	Na <sub>2</sub> SO <sub>4</sub> (aq)	P	No reaction	Reaction occurs	Reaction occurs	No reaction	Q	Reaction occurs	Reaction occurs	Reaction occurs	Reaction occurs	R	No reaction	Reaction occurs	No reaction	No reaction	S	No reaction	No reaction	No reaction	No reaction	1
Sample	MgSO <sub>4</sub> (aq)	Zn (NO <sub>3</sub> ) <sub>2</sub> (aq)	CaSO <sub>4</sub> (aq)	Na <sub>2</sub> SO <sub>4</sub> (aq)																							
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Q	Reaction occurs	Reaction occurs	Reaction occurs	Reaction occurs																							
R	No reaction	Reaction occurs	No reaction	No reaction																							
S	No reaction	No reaction	No reaction	No reaction																							
7	<p>A student drops pieces of Potassium and Silver in beaker 1 &amp; 2 containing water. What are the products formed in beaker 1 &amp; 2 respectively?</p> <p>a) K<sub>2</sub>O, H<sub>2</sub>O and AgO, H<sub>2</sub>O      b) KOH, H<sub>2</sub>O, and Ag<sub>2</sub>O, H<sub>2</sub>O  c) KOH, H<sub>2</sub>O and No reaction takes place      d) K<sub>2</sub>O, H<sub>2</sub>O and No reaction take place.</p>	1																									
8	<p>The exit of undigested food matter is regulated by:</p> <p>a) anus      b) kidney      c) anal sphincter      d) large intestine.</p>	1																									
9	<p>Plants prepare a compound 'A' during photosynthesis which gets converted to compound 'B' for storage as reserve food. What is A and B?</p> <p>a) A - Glucose and B - Sucrose      b) A – Sucrose and B - Glucose  c) A – Glucose and B - Starch      d) A - Starch and B - Glucose</p>	1																									
10	<p>At which level of the food chain does conversion of organic substances into simple inorganic substances take place?</p>  <p>a) Decomposers      b) Primary consumers      c) Secondary consumers      d) Producers</p>	1																									
11	<p>Which of the following features related to a food chain is incorrect?</p> <p>i) Energy flow in a food chain is unidirectional      ii) Primary consumers can only be herbivores  iii) The number of trophic levels in a food chain is limited.  iv) Energy is created in a food chain.</p> <p>a) (ii) only      b) (ii) and (iii)      c) (ii) and (iv)      d) (iii) only</p>	1																									
12	<p>Plants use energy from ATP for the transport of:</p> <p>a) water      b) water and minerals      c) food      d) oxygen</p>	1																									
13	<p>When an incident ray of light enters a medium from air, it bends towards the normal. Which of the following is true about the refractive index if the medium (<math>n_m</math>) as compared to the refractive index of air (<math>n_a</math>)?</p> <p>a) <math>n_m</math> is equal to <math>n_a</math>      b) <math>n_m</math> is less than <math>n_a</math>      c) <math>n_m</math> is more than <math>n_a</math>  d) The refractive indices cannot be compared based on the given information.</p>	1																									
14	<p>Which of these is a reason why a far-sighted person needs a convex lens to correct his vision?</p> <p>a) The image forms in front of his retina      b) The image forms behind the retina  c) The image forms below the retina      d) The image forms on the the retina.</p>	1																									

15	<p>The given diagram represents a single nephron from a mammalian kidney. Identify the regions of reabsorption.</p>  <p>a) A and B                      b) B and C                      c) C and D                      d) A and C</p>	1								
16	<p>The hormone that lowers glucose in blood is secreted by:</p> <p>a) Pituitary                      b) Thyroid                      c) Adrenals                      d) Pancreas</p>	1								
<p>Question No. 17 to 20 consist of two statements - Assertion <b>(A)</b> and Reason <b>(R)</b>. 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	<p><b>Assertion(A):</b> During chemical reaction atoms of one element do not change into those of another element nor disappear from the mixture. <b>Reason(R):</b> As chemical reaction involves the breaking and making of bonds between atoms to produce new substance.</p>	1								
18	<p><b>Assertion(A):</b> Mode of nutrition in animals is heterotrophic. <b>Reason(R):</b> The small intestine in all animals are very long.</p>	1								
19	<p><b>Assertion (A):</b> Longer wires have greater resistance and the smaller wires have lesser resistance. <b>Reason (R):</b> Resistance is inversely proportional to the length of the wire.</p>	1								
20	<p><b>Assertion(A):</b> Producers have maximum energy. <b>Reason(A):</b> Consumers depend on producers for food.</p>	1								
<p><b>Section-B</b></p> <p>Question No. 21 to 26 are very short answer questions</p>										
21	<p>Steffi finds a white substance covered with paper in a chemistry lab. She keeps the paper near the window of the lab and comes back to pick it up after five hours to take it home. She noticed that the white substance had turned grey.</p> <p>a) What could be the most likely substance on the paper that Steffi found?  b) Write the chemical equation for the above reaction.</p>	2								
22	<p>Secretion of growth hormone should be in specific amounts in the human body. Justify the statement.</p>	2								
23	<p>State the functions of the following in digestion. a) Bile juice                      b) HCl</p> <p style="text-align: center;"><b>OR</b></p> <p>Briefly explain why the length of small intestine is different in herbivores and carnivores.</p>	2								
24	<p>The refractive indices of three media are given below:</p> <table border="1" data-bbox="565 1671 964 1822" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Medium</th> <th>Refractive Index</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>1.8</td> </tr> <tr> <td>B</td> <td>2.0</td> </tr> <tr> <td>C</td> <td>1.5</td> </tr> </tbody> </table> <p>A ray of light is travelling from A to B and another ray is travelling from B to C.</p> <p>(a) In which of the two cases the refracted ray bends towards the normal?  (b) In which case does the speed of light increase in the second medium? Give reasons for your answer.</p>	Medium	Refractive Index	A	1.8	B	2.0	C	1.5	2
Medium	Refractive Index									
A	1.8									
B	2.0									
C	1.5									

25	<p>Suresh arranges the electric circuit shown below to measure the current flowing through and the potential difference of a bulb.</p>  <p>Is the circuit is corect? If not, then indentify the mistake.</p>	2
26	<p>Explain the formation of Ozone gas in the atmosphere.</p>	2
<p><b>Section-C</b> Question No. 27 to 33 are short answer questions</p>		
27	<p>a) You are provided with 90 mL of distilled water and 10 mL of concentrated sulphuric acid to prepare dilute sulphuric acid. How will the concentration of <math>H_3O^+</math> ions change with dilution? b) Rahul found that the plaster of Paris, which he stored in a container, had become very hard and lost its binding nature. What is the reason for this? Also, write a chemical equation to represent the reaction taking place.</p>	3
28	<p>A student takes three beakers A, B, and C filled with an aqueous solution of glucose, alcohol, and hydrochloric acid respectively as shown in the following figure.</p>  <p>a) State your observation in terms of the glowing of the bulb when the switch is on in beakers A and C. b) Justify your observations in each case. c) Mention the change noticed with an appropriate reason if the content of beaker B is replaced by potassium hydroxide solution.</p> <p style="text-align: center;"><b>OR</b></p> <p>a) A yellow powder (A) gives off a pungent smell when left open. It is a good oxidizing agent and is used for bleaching cotton linen in the textile industry. Identify (A) and give its method of preparation with a chemical equation. b) A compound P forms the enamel of teeth. It is the hardest substance in the body. It does not dissolve in water but gets corroded when the pH is below 5.5. Identify the compound P.</p>	3
29	<p>a) What is chemotropism? b) State any two differences between growth dependent and growth independent movement in plants.</p>	3

30 Observe the diagram given and answer the questions that follow:



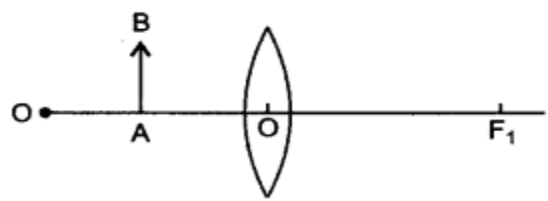
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- a) How is the blood flowing through the part labelled 2 different from that flowing through the part labelled 10?  
 b) With the help of a flowchart depict the flow of oxygenated blood through the heart.

31 a) Figure shows the transmitted rays through lens kept in a box. Draw the lens and complete the path of rays.

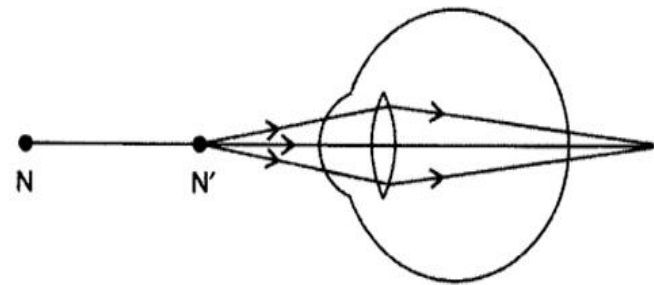


b) Diagram shows an object AB placed on the principal axis of a convex lens placed in air. Draw the lens and complete the path of rays.



3

32 Study the diagram given below and answer the questions that follow it:



3

- a) Which defect of vision is represented in this case? Give reason for your answer.  
 b) What could be the two causes of this defect?  
 c) With the help of a diagram show how this defect can be corrected by the use of a suitable lens.

33 a) How much current will an electric bulb draw from 220 V source if the resistance of the bulb is 1200 Ω? If in place of bulb, a heater of resistance 100 Ω is connected to the sources, calculate the current drawn by it.

3

- b) i) Define the term 'volt'.  
 ii) State the relation between work, charge and potential difference for an electric circuit.  
 iii) Calculate the potential difference between the two terminals of a battery if 100 J of work is required to transfer 20 C of charge from one terminal of the battery to the other.

**Section-D**

Question No. 34 to 36 are long answer questions.

34	<p>a) Two ores A and B were taken. On heating, ore A gives <math>\text{CO}_2</math> whereas, ore B gives <math>\text{SO}_2</math>. What steps will you take to convert them into metals? Support your answer with chemical equations.</p> <p>b) A metal X, which is used in thermite process, when heated with oxygen gives an oxide Y, which is amphoteric in nature. Identify X and Y.</p> <p align="center"><b>OR</b></p> <p>An element E combines with oxygen to form an oxide, <math>\text{E}_2\text{O}</math>.</p> <p>a) How many electrons will be present in the valence shell of element E?</p> <p>b) Show the formation of a compound when the element E combines with fluorine by transferring electrons.</p> <p>c) Give reasons why metal sulphides occur mainly in rocks but metal halides occur mostly in seawater and lake water.</p>	5
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35	<p>a) In what form is food transported in plants and through which tissue?</p> <p>b) Briefly explain the ascent of sap during daytime in a tall tree.</p> <p align="center"><b>OR</b></p> <p>a) What is the importance of small intestine in the process of nutrition in humans?</p> <p>b) Carbohydrate digestion begins in the oral cavity but does not occur in the stomach. Why?</p>	5
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	<p>a) What is meant by electric current? Name and define its SI unit. In a conductor electrons are flowing from B to A. What is the direction of conventional current? Give justification for your answer. A steady current of 1 ampere flows through a conductor. Calculate the number of electrons that flows through any section of the conductor in 1 second. (Charge on electron <math>1.6 \times 10^{-19}</math> coulomb).</p> <p>b) The figure below shows three cylindrical copper conductors along with their face areas and lengths. Discuss in which geometrical shape the resistance will be highest.</p> <div style="text-align: center;"> <p>The diagram shows three cylindrical conductors. Conductor (i) has length L and face area A. Conductor (ii) has length 2L and face area <math>\frac{A}{2}</math>. Conductor (iii) has length <math>\frac{L}{2}</math> and face area 2A.</p> </div> <p align="center"><b>OR</b></p> <p>a) What is meant by spectrum of white light? How can we recombine the components of white light after a prism has separated them? Draw a diagram to illustrate it.</p> <p>b) Give reasons: (i) The extent of deviation of a ray of light on passing through a glass prism depends on its colour. (ii) Lights of red colour are used for danger signals.</p>	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>Sunita carried out the following reactions in the laboratory:</p> <p>(i) complete neutralization of one mole of sodium carbonate with hydrochloric acid.</p> <p>(ii) complete neutralization of one mole of sodium hydrogen carbonate with hydrochloric acid.</p> <p>She found that the amount of carbon dioxide formed in both reactions was the same.</p> <p>a) Is her finding correct? Justify your answer with chemical equations.</p> <p>iii) What would happen if Sunita passed released gas in excess amount through lime water? Write the chemical equation for it.</p>	4
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**OR**

If Sunita's mother uses baking soda instead of baking powder in the cake preparation, how will it affect the taste of the cake and why? How can baking soda be converted into baking powder?

38 By comparing TSH (Thyroid stimulating hormone) with T<sub>4</sub>(Thyroxine)values, we get a clearer picture of the thyroid functioning.

TSH value and T <sub>4</sub> value	State of thyroid gland
i)Normal TSH + normal T <sub>4</sub>	normal thyroid function
ii)Low TSH + high T <sub>4</sub>	overactive thyroid
iii)High TSH + low T <sub>4</sub>	underactive thyroid

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

- Which of the above given state of thyroid causes simple goitre and why?
- What is the role of thyroid hormone in our body?
- In India, it is found that incidence of simple goitre is more in inland cities like Hyderabad, Bengaluru etc compared to cities like Mumbai, Cochin etc. What could be the reason for this?

**OR**

What is the major symptom of simple goitre and how is it related to the location of the thyroid gland?

39 The spherical mirror forms different types of images when the object is placed at different locations. When the image is formed on screen, the image is real and when the image does not form on screen, the image is virtual. When the two reflected rays meet actually, the image is real and when they appear to meet, the image is virtual. A concave mirror always forms a real and inverted image for different positions of the object. But if the object is placed between the focus and pole. the image formed is virtual and erect. A convex mirror always forms a virtual, erect and diminished image. A concave mirror is used as doctor's head mirror to focus light on body parts like eyes, ears, nose etc., to be examined because it can form erect and magnified image of the object. The convex mirror is used as a rear view mirrors in automobiles because it can form a small and erect image of an object.

- Between which two points related to a concave mirror should an object be placed to obtain on a screen an image twice the size of the object?
- Which kind of mirrors are used in the headlights of a motor-car and why?
- List four properties of the image formed by a concave mirror, when object is placed between focus and pole of the mirror.

**OR**

Draw the following diagram in your answer book and show the formation of image of the object AB with the help of suitable rays.

