

**केन्द्रीय विद्यालय संगठन, बेंगलूरु संभाग**  
**KENDRIYA VIDYALAYA SANGATHAN, BENGALURU REGION**  
**प्रथम प्री-बोर्ड परीक्षा-2024-2025**  
**FIRST PRE-BOARD EXAMINATION-2024-25**

**Class: X**

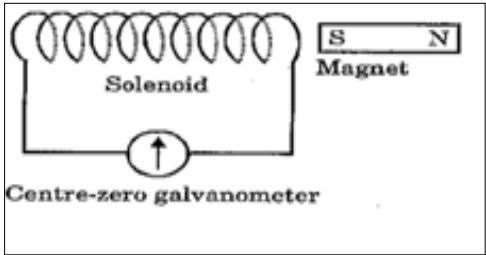
**Max marks:80**

**Subject: Science (086)**

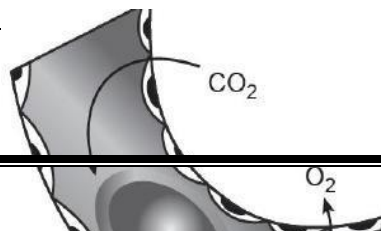
**Time allowed: 3 hours**

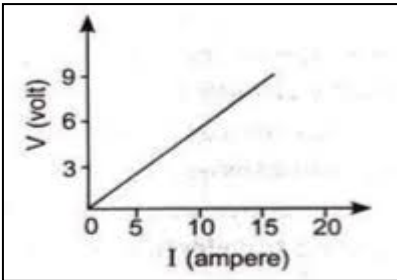
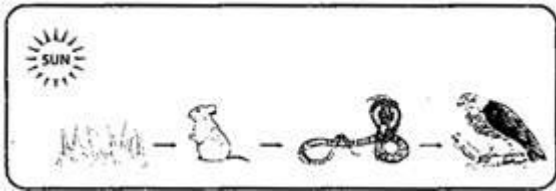
General Instructions.

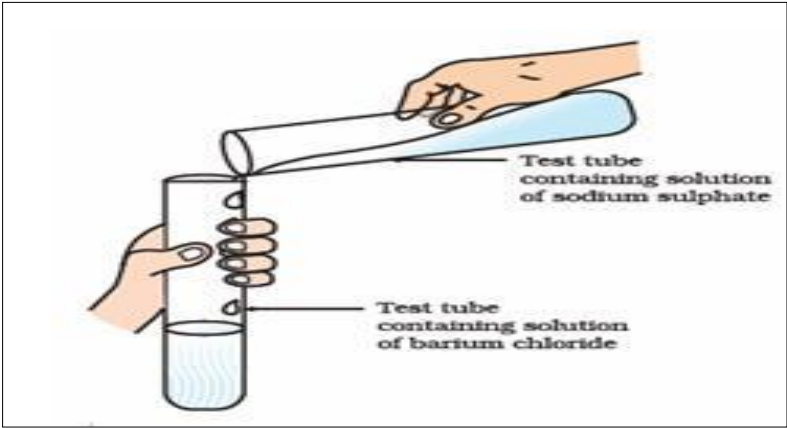
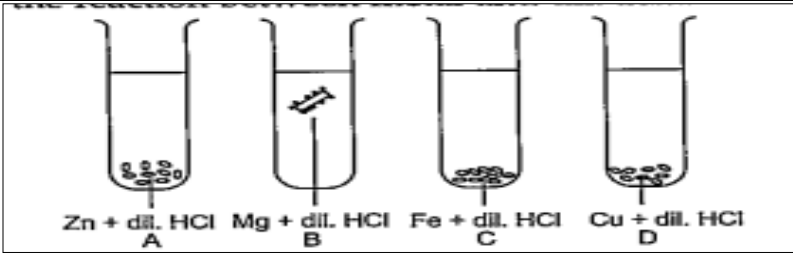
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 16 MCQs and 4 Assertion -Reasoning type questions carrying 1 mark each.
- iv. Section B consists of 6 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. Sub- part 'C' has internal choice.

<b>SECTION –A</b>		
Q NO.	Question 1 to 16 is multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.	MARKS
1	What is formed when zinc reacts with sodium hydroxide? (a) Zinc hydroxide and sodium                      (b) Sodium zincate and hydrogen gas (c) Sodium zinc-oxide and hydrogen gas      (d) Sodium zincate and water	1
2	A homozygous dominant guinea pig with black fur is crossed with a homozygous guinea pig with white fur. The F1 generation is crossed with itself. What percentage of F2 generation is expected to show white fur coat? a) 25%                      b) 50%                      c) 75%                      d) 100%	1
3	In the given diagram, when the magnet is pushed into the solenoid, the pointer of the galvanometer deflects slightly to the left. Which of the following would produce a deflection of the pointer towards the right? <div style="text-align: center;">  <p style="text-align: center;">Solenoid                      Magnet</p> <p style="text-align: center;">Centre-zero galvanometer</p> </div> (a) Move the solenoid towards the magnet. (b) Move the solenoid away from the magnet.	1

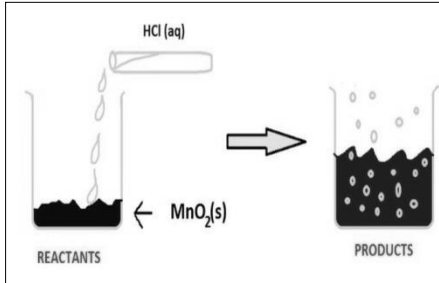
	(c) Move the magnet faster into the solenoid. (d) By placing the magnet above the coil.	
4	<p>The graph below depicts a neutralization reaction. The pH of a solution changes as we add excess of acid to an alkali.</p> <p>Which letter denotes the area of the graph where both acid and acidic salt are present? (a) A                      (b) B                      (c) C                      (d) D</p>	1
5	<p>A student conducts an activity where he took ethanoic acid and ethanol in the presence of an acid catalyst. He noticed that the resulted product has some sweet-smelling fragrance. What is likely to be the product?</p> <p>(a) <math>\text{CH}_3\text{COOC}_2\text{H}_5 + \text{H}_2\text{O}</math> (b) <math>\text{CH}_3\text{COOH} + \text{H}_2\text{O}</math> (c) <math>\text{C}_2\text{H}_5\text{OH} + \text{H}_2\text{O}</math> (d) <math>\text{COOH} + \text{H}_2\text{O}</math></p>	1
6	<p>Which of these series can be classified as homologous series?</p> <p>(a) <math>\text{CHCl}_3</math>, <math>\text{C}_2\text{H}_5\text{OH}</math>, <math>\text{C}_3\text{H}_7\text{OH}</math> (b) <math>\text{CH}_3\text{OH}</math>, <math>\text{C}_2\text{H}_5\text{OH}</math>, <math>\text{C}_3\text{H}_7\text{OH}</math> (c) <math>\text{CHCl}_3</math>, <math>\text{C}_4\text{H}_9\text{OH}</math>, <math>\text{CH}_3\text{COOH}</math> (d) <math>\text{CH}_3\text{COOH}</math>, <math>\text{C}_4\text{H}_9\text{OH}</math>, <math>\text{C}_2\text{H}_5\text{OH}</math></p>	1
7	<p>A student traces the path of a ray of light through a glass prism for different angles of incidence. He analyses each diagram and draws the following conclusion:</p> <p>(I) On entering prism, the light ray bends towards its base. (II) Light ray suffers refraction at the point of incidence and point of emergence while passing through the prism. (III) Emergent ray bends at certain angle to the direction of the incident ray. (IV) While emerging from the prism, the light ray bends towards the vertex of the prism. Out of the above inferences, the correct ones are:</p> <p>(a) (I), (II) and (III)                      (b) (I), (III) and (IV) (c) (II), (III) and (IV)                      (d) (I) and (IV)</p>	1
8	Given below is a diagrammatic representation	1



	<p>of a process taking place in the human body. In which of these regions/organs could it be occurring?</p> <p>(i) lungs (ii) heart (iii) brain</p> <p>(a) only in (i) (b) only in (ii) (c) only in (i) and (ii) (d) in all - (i), (ii) and (iii)</p>	
9	<p>Magnesium ribbon burns with a dazzling white light in air and form a white powder. Identify the chemical composition of white powder.</p> <p>a) Magnesium carbonate b) Magnesium oxide c) Magnesium nitrate d) Magnesium sulphate</p>	1
10	<p>Which of the following statement (s) is (are) true about the heart?</p> <p>(i) The left atrium receives oxygenated blood from different parts of the body while the right atrium receives deoxygenated blood from lungs (ii) Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs (iii) Left atrium transfers oxygenated blood to the right ventricle which sends it to different body parts (iv) The right atrium receives deoxygenated blood from different parts of the body while the left ventricle pumps oxygenated blood to different parts of the body.</p> <p>(a) (i)      (b) (ii)      (c) (ii) and (iv)      (d) (i) and (iii)</p>	1
11	<p>The resistance whose V – I graph is given below is</p> <div style="text-align: center;">  </div> <p>(a) <math>5/3 \Omega</math>      (b) <math>3/5 \Omega</math>      (c) <math>5/2 \Omega</math>      (d) <math>2/5 \Omega</math></p>	1
12	<p>Which of these statements would be correct if the population of snakes is greatly increased?</p> <div style="text-align: center;">  </div> <p>A. Population of green plants will decrease.</p>	1

	<p>B. Population of mice will decrease.  C. Population of snakes will decrease.  D. Population of hawk will decrease.</p>	
13	<p>A student took sodium sulphate solution in a test tube and added barium chloride solution to it. He observed that an insoluble substance has formed. The colour and molecular formula of the insoluble substance is:</p>  <p>(a) Grey, <math>\text{Ba}_2\text{SO}_4</math> (b) Yellow, <math>\text{Ba}(\text{SO}_4)_2</math> (c) White, <math>\text{BaSO}_4</math> (d) Pink, <math>\text{BaSO}_4</math></p>	1
14	<p>Which group of organisms do not constitute food chain?  (i) Grass, lion, rabbit, wolf  (ii) Plankton, man, fish, grasshopper  (iii) Wolf, grass, snake, tiger  (iv) Frog, snake, eagle, grass, grasshopper  A) (i) and (iii)  B) (iii) and (iv)  C) (ii) and (iii)  D) (i) and (iv)</p>	1
15	 <p>The above diagram shows the reaction between metal and dil. acid. What is the reason for different behavior of Mg in test tube B?  (a) Mg is lighter element than dil. HCl.  (b) Mg reacts with dil. HCl to produce <math>\text{H}_2</math> gas which helps in floating.  (c) Mg reacts with dil. HCl to produce <math>\text{N}_2</math> gas which helps in floating.  (d) Mg reacts with dil. HCl to produce <math>\text{CO}_2</math> gas which helps in floating.</p>	1
16	<p>If T is for tallness and t for dwarfness, what shall be the genotype of a tall pea plant according to Mendelism ?  a) Tt                      b) Either TT or Tt                      c) tt                      d) TT</p>	1
<p><b>Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:</b></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>Assertion (A): When milk changes into curd, its pH value increases.  Reason (R): During curd formation, lactic acid is produced which makes it acidic.</p>	1
18	<p>Assertion (A): Strength of an electromagnet can be increased by increasing the number of turns per unit length in solenoid coil.  Reason(R): Strength of an electromagnet can be increased by increasing the current flowing through the solenoid.</p>	1
19	<p>Assertion (A): Amphibians can tolerate mixing of oxygenated and deoxygenated blood.  Reason (R): Amphibians are animals with two chambered heart.</p>	1
20	<p>Assertion (A) : Surgical methods are most effective methods of contraception.  Reason (R) : Surgical methods block the path of gametes transport and hence prevent fertilization.</p>	1
<p><b>SECTION – B</b>  Question No. 21 to 26 are very short answer questions</p>		
21	<p>A blue coloured flowering plant denoted by BB is cross-bred with that of a white coloured flower plant denoted by bb.</p> <p>(a) State the colour of the flower you would expect in their F1 generation plants.  (b) What must be the percentage of the white coloured flower plants in the F2 generation if the flowers of F1 generation are self-pollinated?</p>	2
22	<p>Imagine you are playing with a laser pointer and a mirror. You shine the laser at the mirror, and the light beam bounces off. How does the behavior of the laser light compare to the way a ball bounces off a wall? Draw the path of the light beam after it hits the mirror?</p>	2
23	<p>A spherical mirror produces an image of magnification –1 on a screen placed at a distance of 50 cm from the mirror.  (a) Find the distance of the image from the object.  (b) What is the focal length of the mirror?</p> <p style="text-align: center;">OR</p> <p>Draw a ray diagram to show the path of the refracted ray in each of the following cases: A ray of light incident on a concave lens is  (i) Passing through its optical centre.  (ii) Parallel to its principle axis.</p>	2
24	<p>Sexual reproduction generates diversity in the organisms. Justify the statement.</p>	2
25	<p>A zinc plate was put into a solution of copper sulphate kept in a glass container. It was found that blue colour of the solution gets faded gradually with the passage of time. After a few days when zinc plate was taken out of the solution, a number of holes were observed on it.  (a) State the reason for changes observed on the zinc plate.  (b) Write the chemical equation for the reaction involved.</p> <p style="text-align: center;">OR</p> <p>Mention the type of chemical reaction that takes place when:  (i) Ammonia and hydrogen chloride are mixed with each other.</p>	2

	(ii) Limestone is heated. Write the chemical equation for each reaction.	
26	Three resistors A, B and C ,each having $2\ \Omega$ resistance are connected in such a way that the total resistance of the combination is $3\ \Omega$ . Show the arrangement of the three resistors and justify your answer.	2
<b>SECTION –C</b> Question No. 27 to 33 are short answer questions		
27	During electrolysis of Brine, a gas ‘G’ is liberated at anode. When this gas ‘G’ is passed through slaked lime, a compound ‘C’ is formed, which is used for disinfecting drinking water. (i) Write formula of ‘G’ and ‘C’. (ii) State the chemical equations involved. (iii) What is common name of compound ‘C’? Give its chemical name.	3
28	Write the balanced chemical equation for the following reaction: (i) Phosphorus burns in presence of chlorine to form phosphorus pentachloride. (ii) Burning of natural gas. (iii) The process of respiration  OR The reaction of $\text{MnO}_2$ with $\text{HCl}$ is depicted in the following diagram. It was observed that a gas with bleaching abilities was released.  (a) Name the gas liberated during the reaction between $\text{MnO}_2$ and conc. $\text{HCl}$ ? (b) Identify oxidising agent, reducing agent, substance oxidised and substance reduced in reaction of $\text{MnO}_2$ and $\text{HCl}$ .	3
29	(i) What is the major difference between aerobic and anaerobic respiration? (ii) What are the byproducts of anaerobic respiration in muscle cells and yeast respectively? (iii) In which part of the cell does aerobic respiration primarily occur?	3
30	(a) Draw a sectional view of the human heart and label these parts in the diagram – Aorta, Right ventricle and Pulmonary veins. (b) State the functions of the following components of our circulatory system: (i) Blood (ii) Lymph	3
31	Plastic cups were used to serve tea in trains in early days- these could be returned to the vendors, cleaned and reused. Later, Kulhads were used instead of plastic cups. Now, paper cups are used for serving tea. What are the reasons for the shift from Plastic to Kulhads and then finally to paper cups?(any three points)	3
32	(a) State three factors on which the strength of magnetic field produced by a current carrying solenoid depends. (b) Draw circuit diagram of a solenoid to prepare an electromagnet.	3

33	<p>John, an avid movie enthusiast, eagerly booked a seat in the last row of a local cinema hall to enjoy the latest blockbuster. He believed that the elevated &amp; distant view would enhance his movie-watching experience. However, as the film began, John noticed that the images on the screen appeared blurry and indistinct. Despite adjusting his position and trying to focus, the problem persisted, significantly diminishing his enjoyment.</p> <p>a) Name the defect of vision the person is suffering from, mention the type of lens that could be used to correct this defect.  b) List two possible causes of the defect diagnosed in John.  c) Draw the ray diagram of the defect.</p>	3
<b>SECTION – D</b> Question No. 34 to 36 are long answer questions.		
34	<p>Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2 V each, a combination of three resistors of 10 <math>\Omega</math>, 20 <math>\Omega</math> and 30 <math>\Omega</math> connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following:</p> <p>(a) Current through each resistor  (b) Total current in the circuit  (c) Total effective resistance of the circuit.</p> <p style="text-align: center;"><b>OR</b></p> <p>Draw a circuit diagram for a circuit consisting of a battery of five cells of 2 volts each, a 5 <math>\Omega</math> resistor, a 10 <math>\Omega</math> resistor and a 15 <math>\Omega</math> resistor, an ammeter and a plug key, all connected in series. Also connect a voltmeter to record the potential difference across the 15 <math>\Omega</math> resistor and calculate-</p> <p>(i) the electric current passing through the above circuit  (ii) Potential difference across 5 <math>\Omega</math> resistor when the key is closed.</p>	5
35	<p>A and B are two organic compounds with the same molecular formula C<sub>5</sub>H<sub>10</sub>. Write their names and structural formulae in case</p> <p>(a) A is a cyclic compound.  (b) B is a straight chain compound.  (c) Among A and B, which one will have only single bonds?  (d) Which one out of 'A' and 'B' has both single and double bonds?</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) Name the simplest saturated hydrocarbon. Draw its electron dot structure. Which type of bonds exists in this compound?  (ii) In which homologous series of carbon compounds can this compound be placed? Write the general formula of the series.  (iii) Which type of flame is produced on burning it?</p>	5
36	<p>(a) Name the mode of reproduction of the following organisms :</p> <p>(i) <i>Amoeba</i>  (ii) <i>Hydra</i>  (iii) <i>Spirogyra</i></p> <p>(b) List two advantages of vegetative propagation over other modes of reproduction.</p> <p style="text-align: center;"><b>OR</b></p>	5

- (i) What happens when-
- Accidentally, *Planaria* gets cut into many pieces-
  - Bryophyllum* leaf falls on the wet soil
  - On maturation sporangia of *Rhizopus* bursts?
- (ii) How do *Plasmodium* and *Leishmania* reproduce? Write one difference in their mode of reproduction.

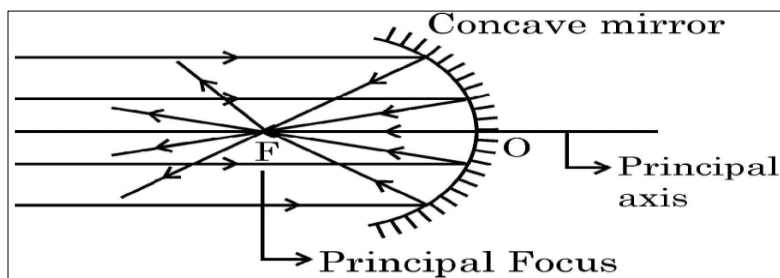
**SECTION- E**

Question No. 37 to 39 are case-based/data -based questions.

37

Hold a concave mirror in your hand and direct its reflecting surface towards the sun. Direct the light reflected by the mirror on to a white card-board held close to the mirror. Move the cardboard back and forth gradually until you find a bright, sharp spot of light on the board. This spot of light is the image of the sun on the sheet of paper; which is also termed as “Principal Focus” of the concave mirror.

4



- List two applications of concave mirror.
- If the distance between the mirror and the principal focus is 15 cm, find the radius of curvature of the mirror.
- Draw a ray diagram to show the type of image formed when an object is placed between pole and focus of a concave mirror.

OR

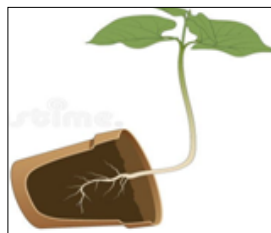
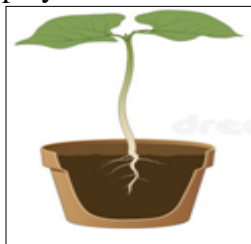
(c) An object 10 cm in size is placed at 100 cm in front of a concave mirror. If its image is formed at the same point where the object is located, find:

- focal length of the mirror, and
- magnification .

38

In a school science experiment, students planted bean seeds in two pots. Pot A was placed in a well-lit area near the window, while Pot B was kept in a dark cupboard. Over the next two weeks, the students observed the growth of the plants. The plant in Pot A grew straight and healthy with green leaves, while the plant in Pot B became dull, pale, and weak, with small yellow leaves. The students concluded that light plays a crucial role in the healthy growth of plants.

4



**Pot A before**

**Pot A after falling down**

- Which tropic movement is shown by the stems of the plants here?
- Name the hormone present at the shoot tip of the plant.

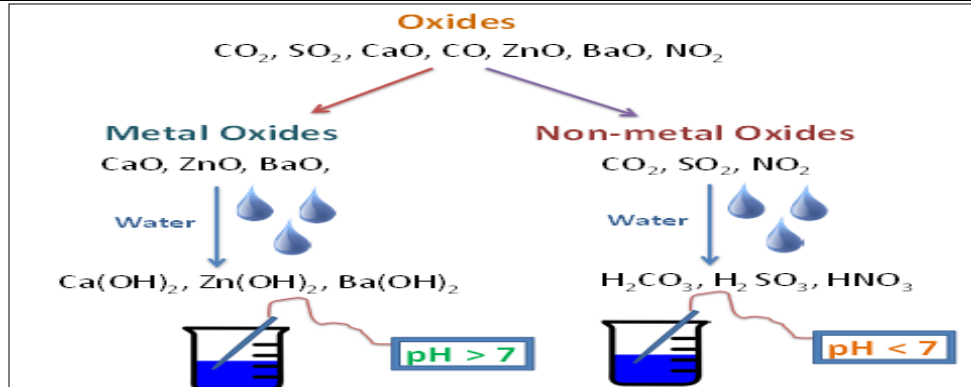


(c) If Pot A falls, after 1 week, in which direction will the shoots start to grow? What can be the reason for this?

OR

(c) What is chemotropism? Provide an example of where it is observed in plants.

39



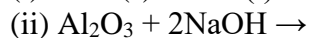
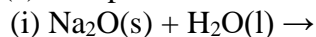
4

Almost all metals combine with oxygen to form metal oxides. Metal oxides are generally basic in nature. But some metal oxides show both basic as well as acidic behaviour. Different metals show different reactivities towards oxygen. Some react vigorously while some do not react at all.

(a) What happens when copper is heated in air? (Give the equation of the reaction involved).

(b) Why are some metal oxides categorized as amphoteric? Give one example.

(c) Complete the following equations:



OR

(c) On burning Sulphur in oxygen a colourless gas is produced.

(i) Write chemical equation for the reaction.

(ii) Name the gas formed and State the nature of the gas.

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