

**COIMBATORE SAHODAYA SCHOOLS COMPLEX**  
**CBESSC Pre Board Examination 2024-2025**  
**SCIENCE (086)**  
**SET A**

Class: X

Time: 3 Hrs

Name: \_\_\_\_\_

Max. Marks: 100

**General Instructions:**

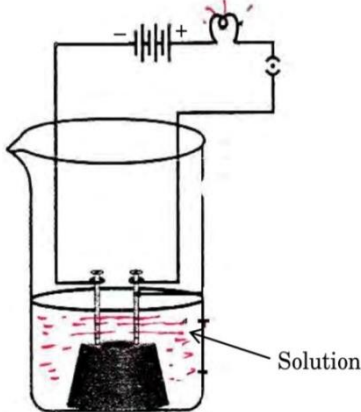
Read the following instructions carefully and strictly follow them:

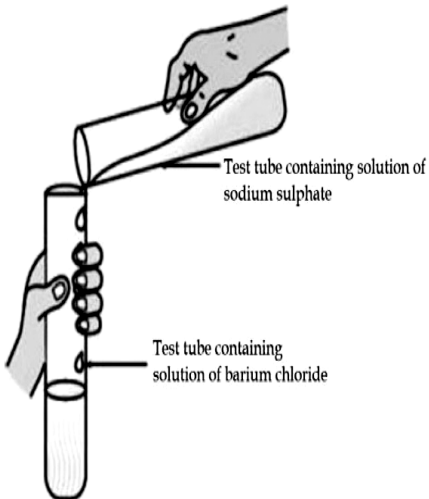
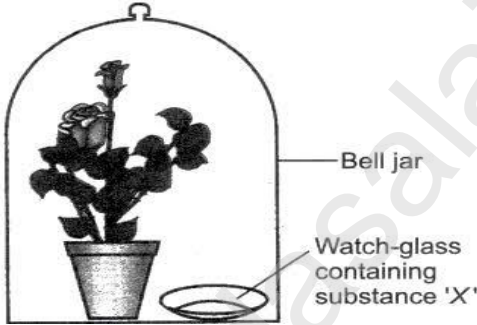
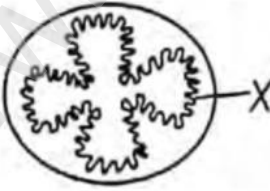
- (i) This question paper consists of 39 questions. All questions are compulsory.
- (ii) Question paper is divided into FIVE sections viz. Section A, B, C, D and E.
- (iii) In Section A question number 1 to 20 are Multiple Choice Questions (MCQs) carrying 1 mark each.
- (iv) In Section B question number 21 to 26 are Very Short Answer (VSA) type questions carrying 2 marks each. Answer to these questions should be in the range of 30 to 50 words.
- (v) In Section C question number 27 to 33 are Short Answer (SA) type questions carrying 3 marks each. Answer to these questions should be in the range of 50 to 80 words.
- (vi) In Section D question number 34 to 36 are Long Answer (LA) type - questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
- (vii) In Section E question number 37 to 39 are of 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.
- (viii) There is no overall choice. However, an internal choice has been provided in some Sections

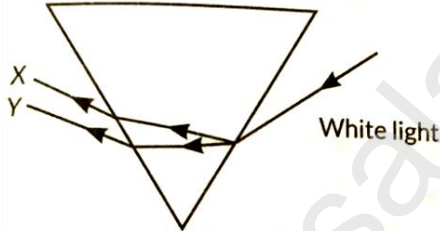
**Section – A**

**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.**

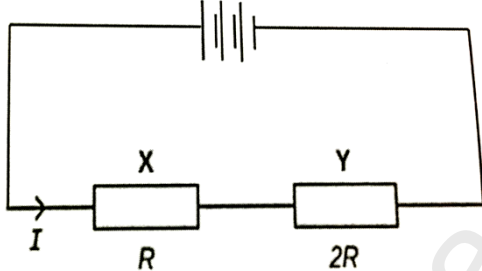
Q.N O		MARK S
1.	$\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$ <p>The reaction given above is redox reaction because in this case:            (A) <math>\text{MnO}_2</math> is oxidised and HCl is reduced.            (B) HCl is oxidised.            (C) <math>\text{MnO}_2</math> is reduced            (D) <math>\text{MnO}_2</math> is reduced and HCl is oxidized</p>	1
2.	<p>Food cans are coated with tin and not with zinc because            (A) zinc is costlier than iron.            (B) zinc has a higher melting point than tin.            (C) zinc is more reactive than tin.            (D) zinc is less reactive than tin.</p>	1
3.	<p>In the given experimental set-up, if the experiment is carried out separately with each of the following solutions the cases in which the bulb will glow is/are :</p>	1

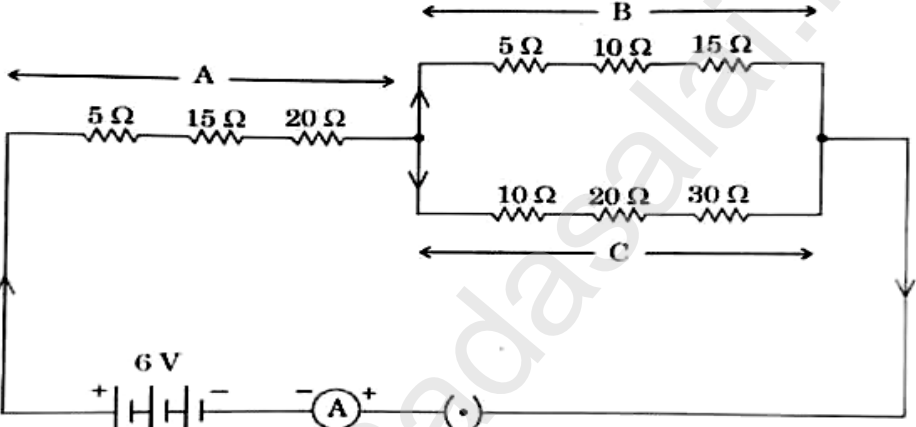
	 <p>(i) Dilute hydrochloric acid  (ii) Dilute sulphuric acid  (iii) Glucose solution  (iv) Alcohol  (A) (i) only  (B) (ii) only  (C) (i) and (ii)  (D) (ii), (iii) and (iv)</p>	
4.	<p>Which of the following statements is correct about an aqueous solution of an acid and of a base?</p> <p>(i) Higher the pH, stronger the acid  (ii) Higher the pH, weaker the acid  (iii) Lower the pH, stronger the base  (iv) Lower the pH, weaker the base  (A) (i) and (iii)  (B) (ii) and (iii)  (C) (i) and (iv)  (D) (ii) and (iv)</p>	1
5.	<p>Which of the following is an example of endothermic process?</p> <p>(A) Formation of slaked lime  (B) Decomposition of vegetable matter into compost  (C) Dissolution of ammonium chloride in water  (D) Digestion of food in our body</p>	1
6.	<p>An element with atomic number _____ will form a basic oxide.</p> <p>(A) 7 (2, 5)  (B) 17 (2, 8, 7)  (C) 14 (2, 8, 4)  (D) 11 (2, 8, 1)</p>	1
7.	<p>Identify the product which represents the solid state in the below reaction.</p>	1

	 <p>(A) Barium chloride (B) Barium sulphate (C) Sodium chloride (D) Sodium sulphate</p>	
8.	<p>Observe the experimental setup shown below. Name the chemical indicated as 'X' that can absorb the gas which is evolved as a byproduct of respiration.</p>  <p>(A) KOH (B) NaOH (C) Ca(OH)<sub>2</sub> (D) K<sub>2</sub>CO<sub>3</sub></p>	1
9.	<p>The diagram represents a section through the small intestine. What is the role of the structure labelled X?</p>  <p>(A) They help to move the food along (B) They protect against bacteria (C) They make a large surface for absorption (D) They move mucus over the surface</p>	1
10.	<p>The breakdown of pyruvate to give carbon-dioxide, water and energy takes place in</p> <p>(A) cytoplasm (B) mitochondria (C) chloroplast (D) nucleus</p>	1
11.	<p>A microscopic gap between a pair of adjacent neurons over which nerve impulses pass is called.</p> <p>(A) axon</p>	1

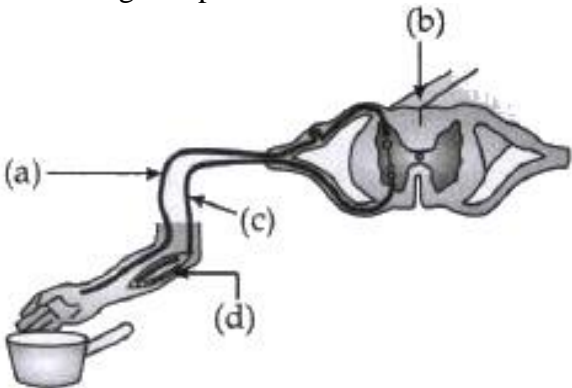
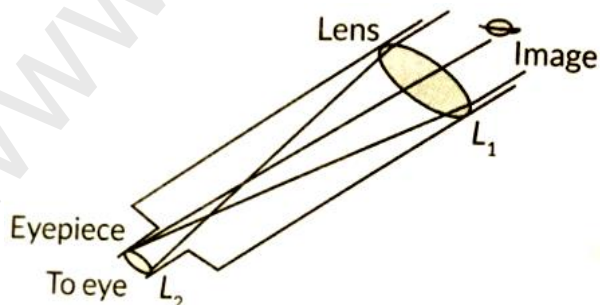
	(B) dendrites (C) neurotransmitter (D) synapse	
12.	In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F <sub>2</sub> generation is  (A) 1:3 (B) 1:1 (C) 3:1 (D) 2:1	1
13.	The image of an object placed in front of a concave mirror of focal length 15 cm is of the same size as the object. The distance between the object and its image is (A) 15 cm (B) 30 cm (C) 60 cm (D) zero	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.	In a food chain comprising of a snake, grass, insect, and frog, the secondary consumer is : (A) insect (B) snake (C) frog (D) grass	1
16.	In a given food chain if the amount of energy at the fourth trophic level is 6 kJ, what will be the energy at the producer level? (A) 6000 kJ (B) 600000 kJ (C) 60kJ (D) 600kJ	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.	<b>Assertion (A):</b> Different metals have different reactivities with water and dilute acids. <b>Reason (R):</b> Extraction of a metal from its ore depends on its position in the reactivity series.	1
18.	<b>Assertion:</b> DNA copying is necessary during reproduction.	1

	<b>Reason:</b> DNA copying leads to the transmission of characters from parents to offspring.													
19.	<b>Assertion (A):</b> A concave lens of very short focal length causes higher divergence than one with longer focal length. <b>Reason (R):</b> The power of a lens is directly proportional to its focal length.	1												
20.	<b>Assertion:</b> Polythene bags and plastic containers are non-biodegradable substances. <b>Reason:</b> They can be broken down by microorganisms naturally into simple harmless substances.	1												
<b>Section – B</b>														
<b>Question No. 21 to 26 are very short answer questions.</b>														
21.	Name the type of chemical reaction in which calcium oxide reacts with water. Justify your answer by giving balanced chemical equation for the chemical reaction.	2												
22.	A. What do you mean by 'translocation' with respect to transport in plants? B. Name the plant tissue involved in the process of translocation.	2												
23.	Attempt either option A or B. A. Tabulate the differences between alveoli and nephron on the basis of the following.	2												
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">S.No.</th> <th style="width: 30%;">Feature</th> <th style="width: 30%;">Alveoli</th> <th style="width: 30%;">Nephron</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Structure and location</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td>Function</td> <td></td> <td></td> </tr> </tbody> </table>	S.No.	Feature	Alveoli	Nephron	1	Structure and location			2	Function			
S.No.	Feature	Alveoli	Nephron											
1	Structure and location													
2	Function													
	<b>OR</b>													
	B. How do anaerobic respiration in yeast is different from human?													
24.	State Snell's law of refraction of light. Write an expression for the absolute refractive index of a medium in terms of speed of light.	2												
25.	Calculate the equivalent resistance of the following electric circuit:	2												
	<b>OR</b>													
	(a) List three factors on which the resistance of a conductor depends. (b) Write SI unit of resistivity.													
26.	A. What is biological magnification? B. From the given food chain identify the organism which trap the maximum energy and an organism which receive the maximum concentration of pesticides from the environment. Plants → goat → human.	2												
<b>Section – C</b>														
<b>Question No. 27 to 33 are short answer questions.</b>														
27.	Name the ore of mercury and state the form in which it is found in nature. Write the chemical equations along with the condition required for the reactions involved in the extraction of mercury from its ore.	3												
28.	(i) The pH of soil A is 7.5 while that of soil B is 4.5. Which of the two soils A or B should be treated with powdered chalk to adjust its pH and why?	3												

	<p>(ii) Name the chemical which is injected into the skin of a person during the nettle leaf sting. How can the effect of these stings be neutralised?</p> <p>(iii) Explain how the pH change in the river water can endanger the lives of aquatic animals like fish?</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) Draw a labelled diagram to show the preparation of hydrogen chloride gas in the laboratory.</p> <p>(ii) Test the gas evolved first with dry and then with wet litmus paper. In which of the two cases does the litmus paper show a change in colour?</p> <p>(iii) State the reason for the exhibiting acidic character by dry HCl gas/HCl solution.</p>	
29.	Explain the mode of nutrition in amoeba.	3
30.	<p>A blue coloured flower denoted by BB is crossbred with that of white coloured flower denoted by bb.</p> <p>(i) State the colour of flower you would expect in the F1 generation plants.</p> <p>(ii) What must be the percentage of white flower plants in F2 generation, if flowers of F1 plants are self pollinated?</p> <p>(iii) State the expected ratio of the genotypes BB and Bb in the F2 progeny.</p>	3
31.	<p>A student uses spectacles of focal length -2.5 m.</p> <p>(a) Name the defect of vision he is suffering from.</p> <p>(b) Which lens is used for the correction of this defect ?</p> <p>(c) List two main causes of developing this defect.</p> <p>(d) Compute the power of this lens.</p>	3
32.	 <p>The above figure shows two resistors X and Y connected in series to a battery. The power dissipated for this combination is <math>P_1</math>. When these resistors are connected in parallel to the same battery then the power dissipated is given by <math>P_2</math>. Find out the ratio <math>P_1 / P_2</math>.</p>	3
33.	<p>(a) State three ways in which the strength of magnetic field produced by a current carrying solenoid can be increased.</p> <p>(b) Draw circuit diagram of a solenoid to prepare an electromagnet.</p>	3
<b>Section – D</b>		
<b>Question No. 34 to 36 are long answer questions.</b>		
34.	<p>(a) A saturated organic compound 'A' belongs to the homologous series of alcohols. On heating 'A' with concentrated sulphuric acid at 443 K, it forms an unsaturated compound 'B' with molecular mass 28 u. The compound 'B' on addition of one mole of hydrogen in the presence of Nickel, changes to a saturated hydrocarbon 'C'.</p> <p>(i) Identify A, B and C.</p> <p>(ii) Write the chemical equations showing the conversion of A into B.</p> <p>(iii) What happens when compound C undergoes combustion ?</p> <p>(iv) State one industrial application of hydrogenation reaction.</p> <p>(v) Name the products formed when compound A reacts with sodium.</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) With the help of diagram, show the formation of micelles, when soap is applied on oily dirt.</p>	5

	<p>(ii) Take two test tubes X and Y with 10 mL of hard water in each. In test tube 'X', add few drops of soap solution and in test tube 'Y' add a few drops of detergent solution. Shake both the test tubes for the same period.</p> <p>(1) In which test tube the formation of foam will be more? Why?</p> <p>(2) In which test tube is a curdy solid formed? Why?</p>	
35.	<p>Attempt either option A or B.</p> <p>A.</p> <p>(i) Enumerate the function/s of the following parts in human female reproductive system:</p> <p>(a) Ovary                      (b) Oviduct                      (c) Uterus</p> <p>(ii) Explain how the developing embryo gets nourishment inside the mother's body.</p> <p style="text-align: center;"><b>OR</b></p> <p>B.</p> <p>(i) Draw a diagram of a germinating seed, and label the part which</p> <p>(a) stores food              (b) forms root              (c) forms shoot</p> <p>(ii) Name an organism in which binary fission occurs in the definite orientation. Draw a labelled diagram showing binary fission in that organism.</p>	5
36.	<p>Study the following electric circuit in which the resistors are arranged in three arms A, B and C.</p>  <p>(a) Find the equivalent resistance of arm A.</p> <p>(b) Calculate the equivalent resistance of the parallel combination of the arms B and C.</p> <p>(c) Determine the current that flows through the ammeter.</p> <p>(d) List two disadvantages of using a series circuit in homes.</p> <p style="text-align: center;"><b>OR</b></p> <p>(a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.</p> <p>(b) In an electric circuit two resistors of <math>12\ \Omega</math> each are joined in parallel to a 6V battery. Find the current drawn from the battery.</p>	5
<b>SECTION – E</b>		
<p><b>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.</b></p>		
37.	<p>Read the following and answer the questions given below.</p> <p>A girl met with an accident and her leg got fractured. She went to an orthopedician for treatment. On examination, the doctor mixed a white powder in water and applied it to her leg along with the cotton and gauze. After a while, it turned into white, solid, hard mass. The doctor said that it would support her fractured bone and help it to join in the right position.</p> <p>(a) What is 'white powder' and 'white hard solid mass'?</p> <p>(b) Write the chemical formula of 'white powder' and 'white hard solid mass'?</p>	4



	<p>(c) (i) Write the preparation of white powder?  (ii) After treatment, doctor repacked the white powder back into moisture proof, airtight container. Why?</p> <p style="text-align: center;"><b>OR</b></p> <p>(c) What is water of crystallisation? Write the chemical formula of two other examples of hydrated salt.</p>	
38.	<p>Look at the given picture and answer the following questions.</p>  <p>(a) Identify the parts (c) and (d) in the given diagram.  (b) How do plants respond to external stimuli without a nervous system?  (c) What is the difference between reflex action and reflex arc?</p> <p style="text-align: center;"><b>OR</b></p> <p>(c) Name the labelled part (a) in the given diagram and mention its function.</p>	4
39.	<p>Sumati wanted to see the stars of the night sky. She knows that she needs a telescope to see those distant stars. She finds out that the telescopes, which are made of lenses, are called refracting telescopes and the ones which are made of mirrors are called reflecting telescopes. So, she decided to make a refracting telescope. She bought two lenses L1 and L2, out of which L1 was bigger and L2 was smaller. The larger lens gathers and bends the light, while the smaller lens magnifies the image. Big, thick lenses are more powerful. So, to see far away objects, she needed a big powerful lens. Unfortunately, she realised that a big lens is very heavy. Heavy lenses are hard to make and difficult to hold in the right place. Also, since the light is passing through the lens, the surface of the lens has to be extremely smooth. Any flaws in the lens will change the image. It would be like looking through a dirty window.</p>  <p>(a) Based on the diagram shown, what kind of lenses would Sumati need to make the telescope?  (b) If the powers of the lens is L1 and L2 or in the ratio of 4:1, what would be the ratio of focal length of L1 and L2?  (c) Name the part of a lens through which a ray of light passes without suffering any deviation. Draw a relevant lens diagram and mark that part of lens. Why does not a ray passing through this point undergo any deviation?</p> <p style="text-align: center;"><b>OR</b></p> <p>(c) Draw a ray diagram to show the image formation by a magnifying lens. State the image characteristics.</p>	4



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