



COMMON PRE-BOARD EXAMINATION

SCIENCE Code No. 086

CLASS-X-(2025-26)

SET: 1



Time allowed: 3 Hrs.

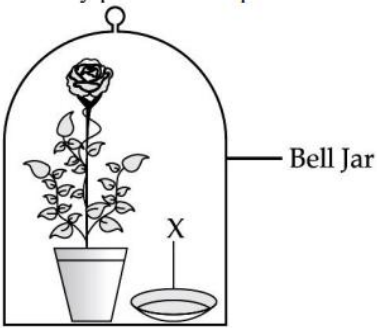
Maximum Marks: 80

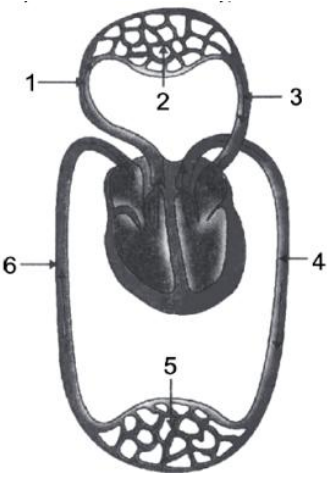
General Instructions:

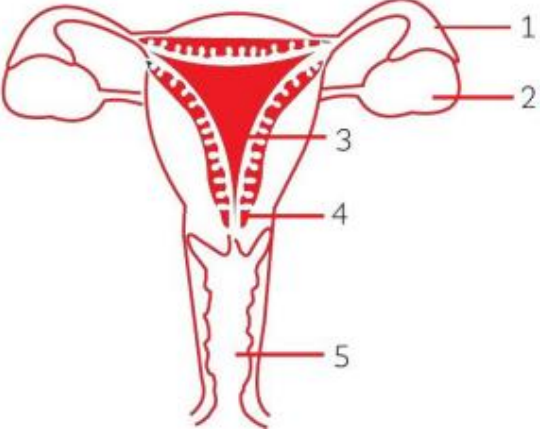
Read the following instructions very carefully and follow them:

- (i) This question paper consists of 39 questions in 3 sections. Section A is Biology; Section B is Chemistry and Section C is Physics.
- (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.

Q. No.	SECTION – A	Marks
1.	<p>A tall pea plant with round seeds (TTRR) is crossed with a short pea plant with wrinkled seeds (ttrr). The F1 generation will be:</p> <p>A. 25% tall with round seeds B. 50% tall with wrinkled seeds C. 75% tall with round seeds D. 100% tall with round seeds</p>	1
2.	<p>In the food chain given below, select the most efficient food chain in terms of energy:</p> <p>A. Grass → Grasshopper → frog → snake B. Plants → Deer → Lion C. Plants → Man D. Phytoplankton → Zooplankton → small fish → large fish</p>	1
3.	<p>Consider the following statements about Ozone.</p> <p>i. Ozone is a poisonous gas ii. Ozone shields the Earth's surface from infra-red radiation from the sun iii. Ozone is the product of UV radiation acting on Oxygen molecules iv. At the lower level of the Earth's atmosphere, Ozone performs most essential functions</p> <p>The correct statements are:</p> <p>A. i and ii B. i and iii C. ii and iii D. ii and iv</p>	1

4.	<p>Observe the experimental setup shown below. Name the chemical indicated as 'X' that can absorb the gas which is evolved as a by-product of respiration.</p>  <p>A. NaOH B. KOH C. Ca(OH)₂ D. K₂CO₃</p>	1															
5.	<p>Walking in a straight line and riding a bicycle are the activities which are possible due to a part of the brain. Choose the correct location and name of this part from the given table:</p> <table border="1"> <thead> <tr> <th></th> <th>Part of the Brain</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>A.</td> <td>Fore brain</td> <td>Cerebrum</td> </tr> <tr> <td>B.</td> <td>Mid brain</td> <td>Hypothalamus</td> </tr> <tr> <td>C.</td> <td>Hind brain</td> <td>Cerebellum</td> </tr> <tr> <td>D.</td> <td>Fore brain</td> <td>Medulla</td> </tr> </tbody> </table>		Part of the Brain	Name	A.	Fore brain	Cerebrum	B.	Mid brain	Hypothalamus	C.	Hind brain	Cerebellum	D.	Fore brain	Medulla	1
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A.	Fore brain	Cerebrum															
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D.	Fore brain	Medulla															
6.	<p>Select from the following the correct statement about the tropic movement in plants-</p> <p>A. It is due to the stimulus of touch and temperature B. It doesn't depend upon the direction of the stimulus received C. It is observed only in roots and not in stems D. It is a growth-related movement.</p>	1															
7.	<p>Sensory nerve of a reflex arc carries information from the receptor cells to the:</p> <p>A. Spinal cord B. Brain C. Muscles of the effector organ D. Bones of the receptor organ</p>	1															
	<p>The following two questions consist of two statements Assertion (A) and Reason (R). Answer these questions by 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>																
8.	<p>Assertion(A): In humans, the respiratory pigment is haemoglobin. Reason(R): Haemoglobin present in platelets transports oxygen to different parts of our body.</p>	1															

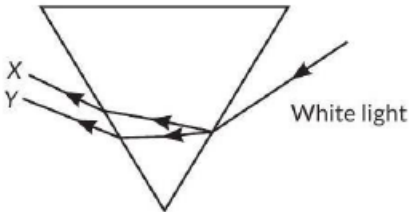
9.	<p>Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) is responsible for brown eyes, then the colour of the eyes of the progeny having gene combination Bb, bb or BB will be black only.</p> <p>Reason (R): The black colour of the eyes is the dominant trait.</p>	1						
10.	<p>In a food chain, state the trophic level at which the concentration of harmful chemicals is maximum. Why is it so?</p>	2						
11.	<p><u>Attempt either option A or B</u></p> <div style="text-align: center;">  </div> <p>A. Label any 4 parts in the given diagram.</p> <p style="text-align: center;">OR</p> <p>B. A scientist girdles the bark around the trunk of a tree. What would be the short-term and long-term effects on the plant?</p>	2						
12.	<p>Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? State any two reasons for your answer.</p>	2						
13.	<p>Study the given data and answer the questions following the data:</p> <table border="1"> <thead> <tr> <th>Parental plants cross-fertilised and seeds collected.</th> <th>F1 First Generation offspring</th> <th>F2 Offspring of self-pollination of F1</th> </tr> </thead> <tbody> <tr> <td>Male parents always bear red flowers. The female parent always had white flowers.</td> <td>330 seeds sown and observed. All 330 gave red flowers.</td> <td>Out of 44 seeds, 33 seeds gave plants with red flowers, and 11 seeds gave plants with white flowers</td> </tr> </tbody> </table> <p>i) What is the term for this type of cross?</p> <p>ii) What does the data of the column marked F1 indicate?</p> <p>iii) Express the gene type of the: (a) parents, (b) F1 progeny and (c) F2 progeny.</p>	Parental plants cross-fertilised and seeds collected.	F1 First Generation offspring	F2 Offspring of self-pollination of F1	Male parents always bear red flowers. The female parent always had white flowers.	330 seeds sown and observed. All 330 gave red flowers.	Out of 44 seeds, 33 seeds gave plants with red flowers, and 11 seeds gave plants with white flowers	3
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14.	<p>There are two similar glands P, which are located on the top of two similar organs Q in the human body. The glands P are often called the glands of emergency, and they secrete a</p>	3						

	<p>hormone R into the bloodstream. The hormone R is secreted in large amounts when a person is frightened. It brings about temporary changes in the body which allow a lot of glucose from the liver to go into the blood to provide a lot of energy in a very short time. This helps the person concerned to fight back or run away from the frightening situation.</p> <p>Identify P, Q, R. Mention the changes caused by R in the body.</p>	
15.	<p><i>Read the given passage and answer the questions based on the passage and related studied concepts.</i></p> <p>Haemodialysis removes waste products from the blood, such as excess salts and urea, which are insufficiently removed by the kidneys in patients with kidney failure. During the procedure, the patient's blood is cleaned by filtration through a series of semipermeable membranes before being returned to the blood of patient. Based on this, answer the following questions:</p> <p><u>Attempt either subpart A or B</u></p> <p>A. Name the filtering units present in the human kidneys.</p> <p style="text-align: center;">OR</p> <p>B. Name the main excreted waste removed by the kidneys from the blood.</p> <p>C. List the two main functions of the kidneys.</p> <p>D. What are the major factors on which the amount of water reabsorbed in the part of the nephron depends?</p>	4
16.	<p><u>Attempt either option A or B</u></p> <p>A. i) Identify the given diagram. Name and write the function of 2 and 3.</p> <div style="text-align: center;">  </div> <p>ii) What are STDs? List two viral and two bacterial STDs.</p> <p style="text-align: center;">OR</p> <p>B. i) What are chromosomes? Explain how in sexually reproducing organisms, the number of chromosomes in the progeny is maintained.</p> <p>ii) Analyse the process of asexual reproduction in Hydra. How is it different from the asexual reproduction in Rhizopus? Substantiate your answer with a neat illustration.</p>	5

SECTION – B		
17.	Identify the reducing agent in the reaction, $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$. A. Fe_2O_3 B. CO C. Fe D. CO_2	1
18.	The chemical formula for Plaster of Paris, which is used for setting fractured bones, is: A. $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ B. $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ C. $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ D. CaSO_4	1
19.	An aqueous solution of ammonium chloride (NH_4Cl) is tested with litmus paper. The expected observation is that: A. Blue litmus turns red. B. There is no change in either litmus paper. C. Red litmus turns blue. D. Both litmus papers are bleached.	1
20.	Dilute sulphuric acid is added to sodium hydrogen carbonate. The gas evolved is then passed through freshly prepared lime water. What is the final observation? A. A reddish-brown gas is seen, which turns lime water orange. B. No gas is evolved. C. Brisk effervescence occurs, and the gas turns lime water milky. D. The solution becomes hot, and the lime water remains clear.	1
21.	Name the compound which is used for softening hard water. A. Bleaching powder B. Caustic soda C. Baking soda D. Washing soda	1
22.	When dissolved in water, which of the following oxides is most likely to form a solution with a pH value greater than 7? A. SO_2 (Sulphur dioxide) B. CO_2 (Carbon dioxide) C. K_2O (Potassium oxide) D. N_2O_5 (Dinitrogen pentoxide)	1
23.	For the reaction of iron with steam, what are the correct values for the stoichiometric coefficients 'p' and 'q'?	1

	<p>$p \text{ Fe(s)} + q \text{ H}_2\text{O(g)} \xrightarrow{\text{Heat}} \text{Fe}_3\text{O}_4\text{(s)} + 4 \text{ H}_2\text{(g)}$</p> <p>A. $p = 1, q = 4$ B. $p = 3, q = 1$ C. $p = 3, q = 4$ D. $p = 2, q = 4$</p>	
	<p>The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by 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>	
24.	<p>Assertion (A): Ethene is an unsaturated hydrocarbon.</p> <p>Reason (R): Ethene molecules contain a double bond between two carbon atoms.</p>	1
25.	<p>Give reasons for the following questions:</p> <p>A. Ionic compounds have high melting and boiling points. B. Sodium and potassium are kept under kerosene.</p>	2
26.	<p>In a laboratory activity, a student takes a small amount of green-coloured ferrous sulphate heptahydrate ($\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$) crystals in a dry boiling tube and heats it over a flame.</p> <p>A. What changes in colour are observed when green ferrous sulphate heptahydrate crystals are heated, and what do these colour changes indicate about the chemical changes taking place? B. Write the balanced chemical equation for thermal decomposition of ferrous sulphate on strong heating.</p> <div style="text-align: center;"> <p>The diagram shows a laboratory setup. At the bottom, a burner is lit and heating a boiling tube. The boiling tube is held by a test tube holder. Inside the boiling tube, there are ferrous sulphate crystals. From the mouth of the boiling tube, a gas is being released, labeled as 'Gas having smell of burning sulphur'. The boiling tube is tilted upwards.</p> </div>	3
27.	<p><u>Attempt either option A or B</u></p> <p>A. (i) Name the constituent metals of the alloy brass. (ii) Stainless steel is preferred over pure iron for making cooking utensils. Give two reasons to justify this preference. (iii) The silver-coloured material used by the dentist contains mercury mixed with other metals. What is such an alloy called?</p>	3

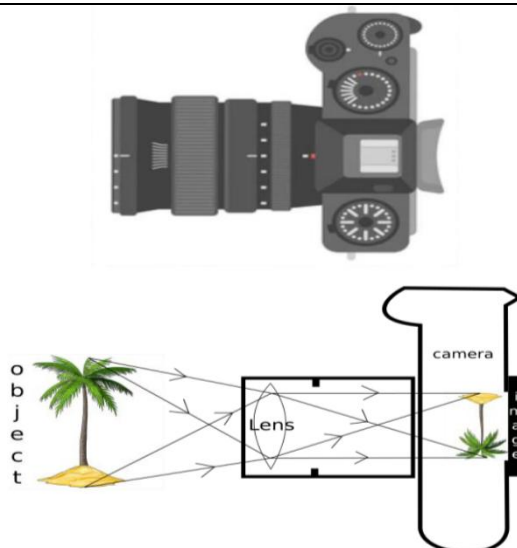
	<p style="text-align: center;">OR</p> <p>B. The chief ore of a metal 'M' is Cinnabar. This metal is placed low in the reactivity series.</p> <p>(i) Identify the metal 'M'.</p> <p>(ii) Name the process used to convert the sulphide ore into its oxide and write the balanced chemical equation for the reaction of the sulphide ore of metal 'M'.</p> <p>(iii) How is metal 'M' subsequently extracted from its oxide? Write the equation.</p>	
28.	<p>Industrial pollution releases gases like Sulphur dioxide and nitrogen dioxide. These dissolve in atmospheric water droplets to form acid rain, which has harmful effects on the environment, including historical monuments like the Taj Mahal, which is made of marble.</p> <p>A. Under what conditions is rainwater considered acid rain, and what causes its acidity?</p> <p>B. Briefly explain how acid rain can harm aquatic ecosystems.</p> <p><u>Attempt either subpart C or D</u></p> <p>C. What is the chemical name of marble? Explain with a chemical equation why it is susceptible to damage from acid rain.</p> <p style="text-align: center;">OR</p> <p>D. A farmer finds that due to continuous use of certain fertilisers, the soil in his field has become basic (pH 8.5), which is unsuitable for the crop he wants to grow. To improve the soil quality, should he add a substance that is acidic or basic in nature? Justify your answer.</p>	4
29.	<p><u>Attempt either option A or B.</u></p> <p>A. (i) What is a homologous series?</p> <p>(ii) Identify the functional group in the compound: a) CH_3COCH_3 b) HCOOH</p> <p>(iii) Write the name and chemical formula of the fourth member of the aldehyde homologous series.</p> <p>(iv) A compound 'X' is formed by the reaction of acetic acid and ethanol in the presence of a few drops of con.H_2SO_4. Give the name of the product 'X' and the name of the reaction. Also, write the chemical equation for the reaction.</p> <p style="text-align: center;">OR</p> <p>B. You are given the following molecular formulae of some hydrocarbons:</p> <p style="text-align: center;">C_5H_8; C_6H_6; C_4H_{10}; C_7H_{12}; C_6H_{12}</p> <p>(i) Identify the formula that represents cyclohexane as well as hexene.</p> <p>(ii) Which two formulae represent unsaturated hydrocarbons having a triple bond?</p> <p>(iii) Draw the possible structural isomers of C_4H_{10}.</p> <p>(iv) Describe what happens when methane reacts with chlorine in the presence of sunlight. Write the chemical equation for the formation of the first product.</p>	5

SECTION – C		
30.	<p>When light is incident on a glass slab, the incident ray, refracted ray and the emergent ray are in three media, A, B and C. If n_1, n_2 and n_3 are the refractive indices of A, B and C, respectively and the emergent ray is parallel to the incident ray, which of the following is true?</p> <p>A. $n_1 < n_2 < n_3$</p> <p>B. $n_1 > n_2 > n_3$</p> <p>C. $n_1 < n_2 = n_3$</p> <p>D. $n_1 = n_3 < n_2$</p>	1
31.	<p>In the diagram given below, X and Y are the end colours of the spectrum of white light. The color of 'Y' represents the _____.</p>  <p>A. colour of sky as seen from Earth during the day</p> <p>B. colour of the sky as seen from the moon</p> <p>C. colour used to paint the danger signals</p> <p>D. colour of the sun at the time of noon.</p>	1
	<p>The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:</p> <p>A. Both A and R are true, and R is the correct explanation of A.</p> <p>B. Both A and R are true, and R is not the correct explanation of A.</p> <p>C. A is true but R is false.</p> <p>D. A is false but R is true.</p>	
32.	<p>Assertion (A): A person cannot see his image in a concave mirror, unless he is standing beyond the centre of curvature of the mirror.</p> <p>Reason (R): In a concave mirror, the image formed is real provided the object is situated beyond its focus.</p>	1
33	<p>Under what condition in an arrangement of two plane mirrors, the incident ray and reflected ray will always be parallel to each other, whatever the angle of incidence. Show the same with the help of a diagram.</p>	2

<p>34.</p>	<p>The arrangement of resistors shown in the figure is connected to a battery. The power dissipation in the $100\ \Omega$ resistor is $81\ \text{W}$.</p> <p>Calculate:</p> <p>(i) the current in the circuit.</p> <p>(ii) the reading in the voltmeter V_2</p>	<p>2</p>
<p>35.</p>	<p>During a campfire, a person notices that objects viewed through the hot air rising above the fire appear wavy or shaky.</p> <p>(i) Identify the optical phenomenon causing this effect.</p> <p>(ii) Explain how the hot air's properties lead to this observation.</p> <p>(iii) How is this phenomenon related to the twinkling of stars?</p>	<p>3</p>
<p>36.</p>	<p>A. (i) State Joule's law of heating effect.</p> <p>(ii) An electric iron is rated $220\ \text{V}$, $2\ \text{kW}$. If the iron is used for $3\ \text{h}$ daily, find the cost of running it for 1 week if it costs ₹ 4.25 per kWh.</p> <p style="text-align: center;">OR</p> <p>B. (i) A copper wire has a length $L = 2\ \text{m}$, a cross-sectional area $A = 0.5\ \text{mm}^2$, and resistivity $\rho = 1.7 \times 10^{-8}\ \Omega\cdot\text{m}$. Calculate the resistance of another wire made of the same material whose length is twice the length of the wire but has the same cross-sectional area.</p> <p>(ii) State one similarity between resistance and resistivity of a wire.</p>	<p>3</p>
<p>37.</p>	<p>The diagram shows the lengthwise section of a current-carrying solenoid. \otimes indicates current entering into the page, \odot indicates current emerging out of the page. Decide which end of the solenoid A or B, will behave as the north pole. Give a reason for your answer. Also, draw field lines inside the solenoid.</p>	<p>3</p>

38.

4



The above image is that of a Digital Single Lens Reflector (DSLR) Camera, which is used to take high-resolution photographs by professional photographers. The second image of the above two is a schematic diagram of how an image is formed on the sensor of the camera. Based on your understanding of the lenses, answer the following questions.

- A. What type of lens is used in the DSLR camera shown in the image?
 B. What type of image is formed on the sensor?

Attempt either subpart C or D.

- C. A photographer is using a DSLR camera with a lens of focal length $f = 50$ mm to take a close-up photograph of a small object. The lens projects an image onto the camera sensor that is located 60 mm behind the lens. Calculate the object distance (i.e., the distance between the object and the lens).

OR

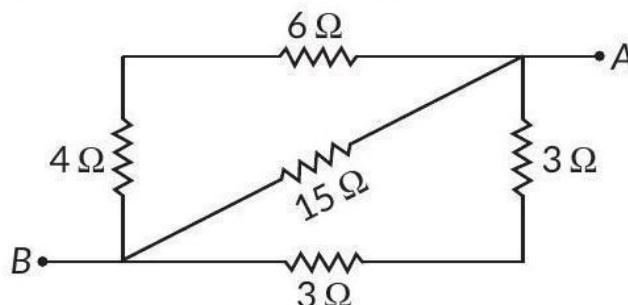
- D. A photographer is using a DSLR camera to take a picture of a flower. The flower is positioned 150 mm away from the camera lens. The actual height of the flower is 80 mm, and the image height formed on the camera's sensor is measured to be 20 mm. Calculate the focal length of the camera lens.

39.

5

Attempt either A or B

- A. (i) List two disadvantages of using a series circuit in homes.
 (ii) Calculate the effective resistance between A and B in the circuit given below:



OR

- B. (a) A bulb is rated 40 W; 220 V. Find the current drawn by it when it is connected to a 220 V supply. Also, find its resistance. If the given bulb is replaced by a bulb of rating 25 W, 220 V, will there be any change in the value of current and resistance? Justify your answer and determine the change.
- (b) A fuse wire melts at 5 A. If it is desired that the fuse wire of the same material melts at 10 A, then whether the new fuse wire should be of a smaller or larger radius than the earlier one? Give reasons for your answer.