COMMON PRE-BOARD EXAMINATION

SCIENCE Code No. 086

CLASS-X-(2025-26)

SET: 3

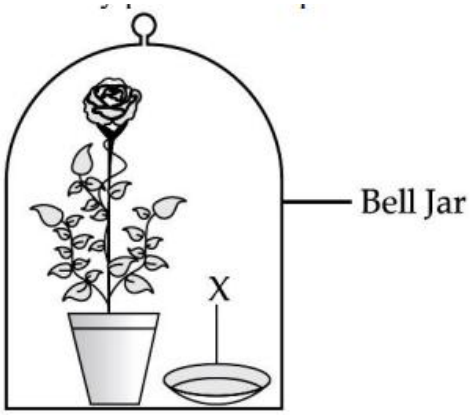
Time allowed: 3 Hrs. **Maximum Marks: 80**

General Instructions:

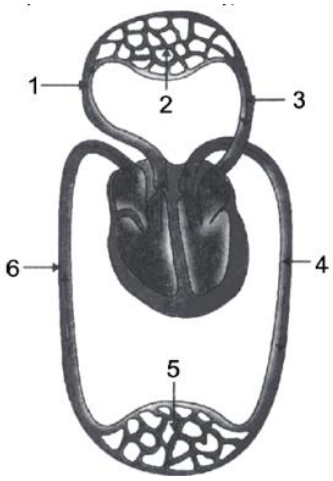
Read the following instructions very carefully and follow them:

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

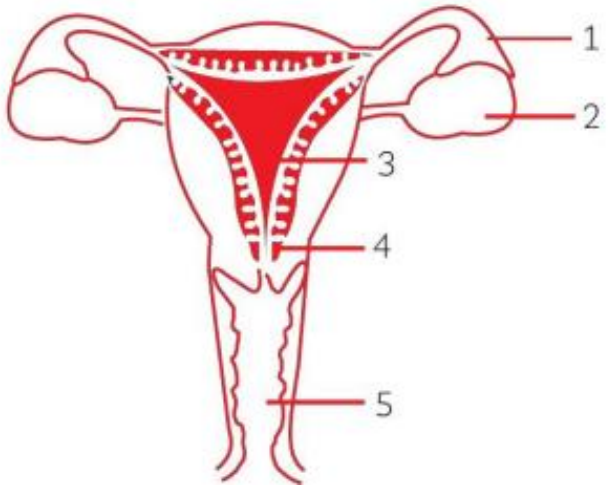
(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

Q. No.	SECTION – A	Marks
1.	Consider the following statements about Ozone. i. Ozone is a poisonous gas ii. Ozone shields the earth surface from infra-red radiations from the sun iii. Ozone is the product of UV radiations acting on Oxygen molecules iv. At the lower level of the earth atmosphere Ozone performs most essential functions The correct statements are: A. i and ii B. i and iii C. ii and iii D. ii and iv	1
2.	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.  A. NaOH B. KOH C. $Ca(OH)_2$ D. K_2CO_3	1

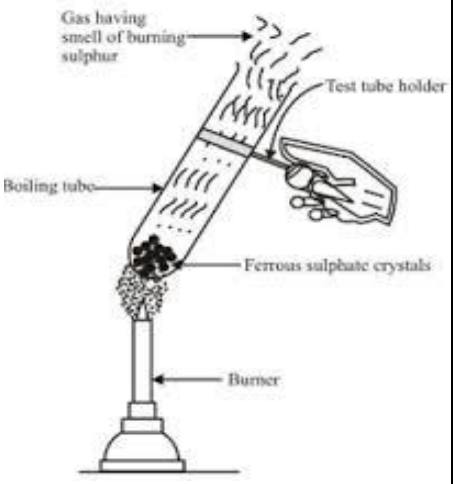
<table>
<tr><td>3.</td><td>Walking in a straight line and riding a bicycle are the activities which are possible due to a part of the brain. Choose the correct location and name of this part from the given table:
<table>
<tr><th></th><th>Part of Brain</th><th>Name</th></tr>
<tr><td>A.</td><td>Fore brain</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>
</table></td><td>1</td></tr>
<tr><td>4.</td><td>A tall pea plant with round seeds (TTRR) is crossed with short pea plant with wrinkled seeds (ttrr). The F1 generation will be:
A. 25% tall with round seeds
B. 50% tall with wrinkled seeds
C. 75% tall with round seeds
D. 100% tall with round seeds</td><td>1</td></tr>
<tr><td>5.</td><td>In the food chain given below, select the most efficient food chain in terms of energy:
A. Grass → Grasshopper → frog → snake
B. Plants → Deer → Lion
C. Plants → Man
D. Phytoplankton → Zooplankton → small fish → large fish</td><td>1</td></tr>
<tr><td>6.</td><td>Select from the following correct statement about the tropic movement in plants-
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.</td><td>1</td></tr>
<tr><td>7.</td><td>Consider the following statements about a reflex arc:
i. It involves the brain for processing the response.
ii. It is the pathway for rapid and involuntary responses.
iii. It connects sensory nerves and motor nerves in the spinal cord.
Which of the following statements are correct?
A. i & ii
B. ii & iii
C. i & iii
D. i, ii & iii</td><td>1</td></tr>
<tr><td></td><td>The following two questions consists of two statements Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:
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</td><td></td></tr>
<tr><td>8.</td><td>Assertion(A): In humans, the respiratory pigment is haemoglobin.
Reason(R): Haemoglobin present in platelets transports oxygen to different part of our body.</td><td>1</td></tr>
<tr><td>9.</td><td>Assertion (A): In humans, if gene (B) is responsible for black eyes and gene (b) responsible for brown eyes, then the colour of the eyes of the progeny having gene combination Bb, bb or BB will be black only.
Reason (R): The black colour of the eyes is the dominant trait.</td><td>1</td></tr>
</table>

<table>
<tr><td>10.</td><td><u>Attempt either option A or B</u>
 

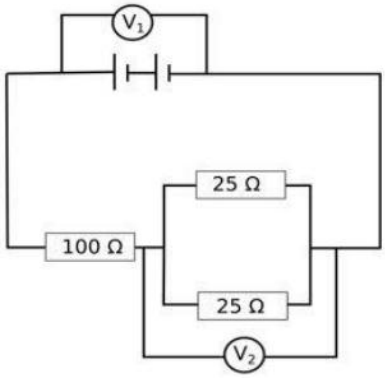
A. Label any 4 parts in the given diagram.
OR
B. A scientist girdles the bark around the trunk of a tree. What would be the short-term and long-term effects on the plant?</td><td>2</td></tr>
<tr><td>11.</td><td>Leaves of a healthy potted plant were coated with vaseline. Will this plant remain healthy for long? State any two reasons for your answer.</td><td>2</td></tr>
<tr><td>12.</td><td>We do not clean ponds or lakes but an aquarium needs to be cleaned regularly. Why?</td><td>2</td></tr>
<tr><td>13.</td><td>Study the given data and answer the questions following the data:
<table>
<tr><td>Parental plants cross fertilized and seeds collected.</td><td>F1 First Generation offsprings</td><td>F2 Offsprings of self-pollination of F1</td></tr>
<tr><td>Male parents always bare red flowers. 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>
</table>
i)What is the term for this type of cross?
ii) What does the data of the column marked F1 indicate?
iii) Express the gene type of the: (a) parents (b) F1progeny and (c) F2 progeny.</td><td>3</td></tr>
<tr><td>14.</td><td>There are two similar glands P which is located on the top of two similar organs Q in the human body. The glands P are often called glands of emergency, and they secrete a 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.
Identify P, Q, R. Mention the changes caused by R in the body.</td><td>3</td></tr>
</table>

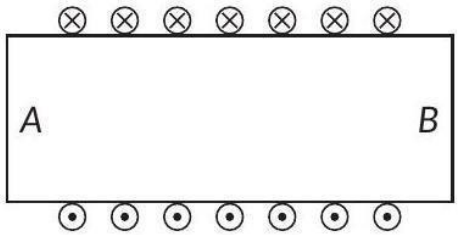
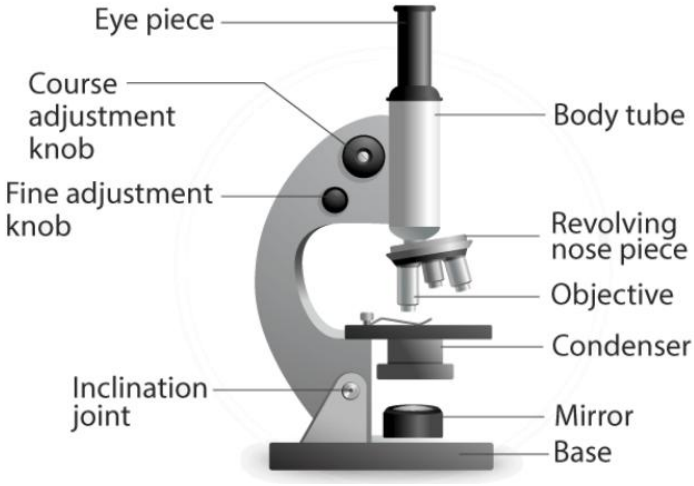
15.	*Read the given passage and answer the questions based on passage and related studied concepts*. Haemodialysis removes waste products from the blood such as excess salts, and urea which are insufficiently removed by the kidney in patients with kidney failure. During the procedure, the patient's blood is cleaned by filtration through a series of semipermeable membranes before being returned to the blood of the patient. On the basis of this, answer the following questions: ***Attempt either subpart A or B*** A. Name the filtering units present in the human kidneys. **OR** B. Name the main excreting waste removed by kidneys from blood. C. List the two main functions of kidneys. D. What are the major factors on which the amount of water reabsorbed in the part of nephron depends?	4
16.	***Attempt either option A or B*** A. i) Identify the given diagram. Name and write the function of 2 and 3.  ii) What are STDs? List two viral and two bacterial STDs. **OR** B. i)What are chromosomes? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained. ii) Analyze the process of asexual reproduction in Hydra. How it is different from the asexual reproduction in Rhizopus? Substantiate your answer with neat illustration.	5
	SECTION – B	
17.	Identify the reducing agent in the reaction, $Fe_2O_3 + 3CO \rightarrow 2\ Fe + 3CO_2$. A. Fe_2O_3 B. CO C. Fe D. CO_2	1

18.	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
19.	Name the compound which is used for softening of hard water. A. Bleaching powder B. Caustic soda C. Baking soda D. Washing soda	1
20.	The chemical formula for Plaster of Paris, which is used for setting fractured bones, is: A. $CaSO_4.2\ H_2O$ B. $CaSO_4.\ H_2O$ C. $CaSO_4.\ ½\ H_2O$ D. $CaSO_4.$	1
21.	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
22.	A student places a clean strip of magnesium metal into a test tube containing a blue solution of copper (II) sulphate. What is the expected observation after some time? A. The solution remains blue, and a greyish layer deposits on the strip. B. A colourless, odourless gas is evolved, and the strip dissolves completely. C. The blue colour of the solution fades, and a reddish-brown solid is deposited on the strip. D. No reaction occurs, and the appearance of the solution and the strip remains unchanged	1
23.	For the reaction of iron with steam, what are the correct values for the stoichiometric coefficient 'p' and 'q'? **p** $Fe(s)+$ **q** $H_2O(g) \xrightarrow{Heat} Fe_3O_4(s) + 4\ H_2(g)$ A. p = 1, q = 4 B. p = 3, q = 1 C. p = 3, q = 4 D. P = 2, q = 4	1
	The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: 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.	
24.	**Assertion (A):** Ethene is an unsaturated hydrocarbon. **Reason (R):** Ethene molecules contain a double bond between two carbon atoms.	1
25.	Give reasons for the following questions: A. Metals are good conductors of electricity. B. Carbon cannot reduce CaO to Ca.	2
26.	In a laboratory activity, a student takes a small amount of green-coloured ferrous sulphate heptahydrate ($FeSO_4.7\ H_2O$) crystals in a dry boiling tube and heats it over a flame. A. What changes in color are observed when green ferrous sulphate heptahydrate crystals are heated, and what do this color changes indicate about the chemical changes taking place? B. Write the balanced chemical equation for the thermal decomposition of ferrous sulphate on strong heating. 	3
27.	***Attempt either option A or B*** **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? **OR** **B.** The chief ore of a metal 'M' is Cinnabar. This metal is placed low in the reactivity series. (i) Identify the metal 'M'. (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'. (iii) How is metal 'M' subsequently extracted from its oxide? Write the equation.	3
28.	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. A. Under what conditions is rainwater considered acid rain, and what causes its acidity? B. Briefly explain how acid rain can harm aquatic ecosystems.	4

	Attempt either subpart C or D C. What is the chemical name of marble? Explain with a chemical equation why it is susceptible to damage from acid rain. **OR** D. A farmer finds that due to continuous use of certain fertilizers, 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.	
29.	***Attempt either option A or B.*** A. (i) What is a homologous series? (ii) Identify the functional group in the compound: a) CH_3COCH_3 b) HCOOH (iii) Write the name and chemical formula of the fourth member of the aldehyde homologous series. (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 name of the reaction. Also, write the chemical equation for the reaction. **OR** B. You are given the following molecular formulae of some hydrocarbons: C_5H_8; C_6H_6; C_4H_{10}; C_7H_{12}; C_6H_{12} (i) Identify the formula that represents cyclohexane as well as hexene. (ii) Which two formulae represent unsaturated hydrocarbons having triple bond? (iii) Draw the possible structural isomers of C_4H_{10}. (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.	5
	SECTION – C	
30.	The danger signals installed at the top of tall buildings are red in color. These can be easily seen from a distance because, among all other colors, the red light A. is scattered the most by smoke or fog B. is scattered the least by smoke or fog C. is absorbed the most by smoke or fog D. move fastest in the air	1
31.	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? A. $n_1 < n_2 < n_3$ B. $n_1 > n_2 > n_3$ C. $n_1 < n_2 = n_3$ D. $n_1 = n_3 < n_2$	1

	The following question consists of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: 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.	
32.	**Assertion (A):** A person cannot see his image in a concave mirror, unless, he is standing beyond the center of curvature of the mirror. **Reason (R):** In a concave mirror, image formed is real provided the object is situated beyond its focus.	1
33.	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.	2
34.	The arrangement of resistors shown in the figure is connected to a battery. The power dissipation in the 100 Ω resistor is 81 W. Calculate: (i) the current in the circuit. (ii) the reading in the voltmeter V_2 	2
35.	A student is unable to see clearly the words written on the blackboard placed at a distance of approximately 4 m from him. (i) Name the defect of vision the boy is suffering from. (ii) Explain the method of correcting this defect. (iii) Draw ray diagram for the: (a) defect of vision and (b) for its correction	3
36.	A. (i) State Joule's law of heating effect. (ii) An electric iron is rated 220 V, 2 kW. If the iron is used for 3h daily, find the cost of running it for 1 week if it costs ₹ 4.25 per kWh. **OR** B. i) A copper wire has a length L = 2 m, a cross-sectional area A = 0.5 mm^2, and resistivity $\rho = 1.7\times10^{-8}$ Ω.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. ii) State one similarity between resistance and resistivity of a wire.	3

37.	Diagram shows the lengthwise section of a current carrying solenoid. ⊗ indicates current entering into the page, ⊙ indicates current emerging out of the page. Decide which end of the solenoid *A* or *B*, will behave as north pole. Give a reason for your answer. Also draw field lines inside the solenoid.  	3
38.	 A compound microscope is an instrument which consists of two lenses L_1 and L_2. The lens L_1 called objective, forms a real, inverted and magnified image of the given object. This serves as the object for the second lens L_2; the eye piece. The eye piece functions like a simple microscope or magnifier. It produces the final image, which is inverted with respect to the original object, enlarged and virtual. A. What types of lenses must be L_1 and L_2? B. (i) What is the value and sign of magnification (according to the new Cartesian sign Convention) of the image formed by L_1? (ii) What is the value and sign of (according to new Cartesian sign convention) magnification of the image formed by L_2? ***Attempt either subpart C or D.*** C. If power of the eyepiece (L_2) is 5 diopters and it forms an image at a distance of 80 cm from its optical centre, at what distance should the object be? **OR** D. With a neat labeled diagram, explain the focal lengths of concave lens and convex lens.	4

39.	***Attempt either A or B***	5

A. An electric lamp of resistance 20 Ω and a conductor of resistance 4 Ω are connected to a 6 V battery as shown in the circuit.

Calculate:

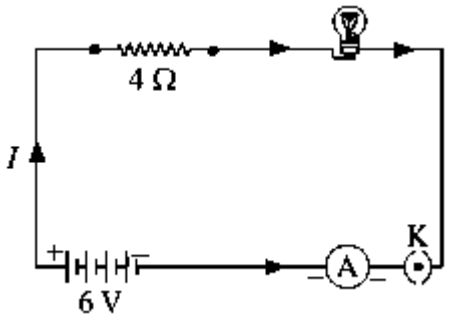
(a) the total resistance of the circuit

(b) the current through the circuit,

(c) the potential difference across the

(i) electric lamp and (ii) conductor, and

(d) Power of the lamp.



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 same material melts at 10 A, then whether the new fuse wire should be of smaller or larger radius than the earlier one? Give reasons for your answer.