Roll No. _____ Series JPR_PBI/25-26/10/086/SET No.1

NOTE:-

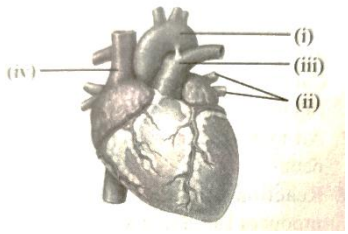
- **Please check that this question paper contains 10 printed pages.**
- **Please check that this question paper contains 39 questions.**
- **Please write down the serial number of the question in the answer-book before attempting it.**
- **15 minutes time has been allotted to read the question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.**

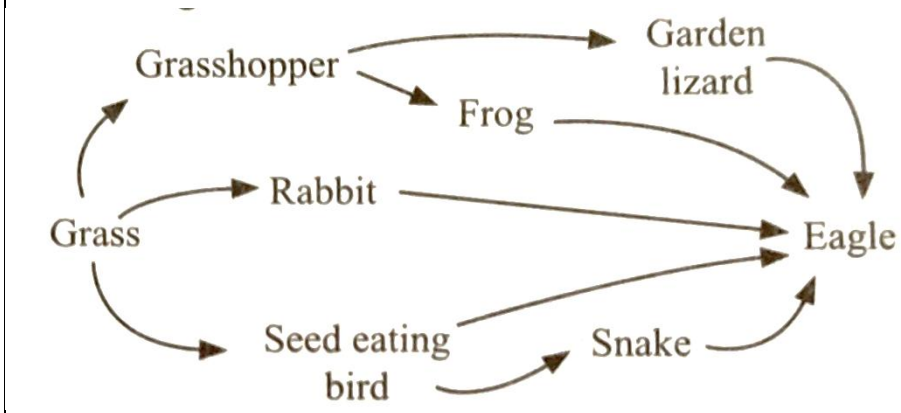
SCIENCE (086)

Time allowed: 3 hours **Maximum Marks: 80**

General Instructions:

(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.

	SECTION A	
1.	The process in which loss of water in the form of vapours from the aerial parts of plants takes place is X, which helps in Y. Here X and Y respectively are :- (a) transpiration and translocation. (b) transpiration and temperature regulation. (c) translocation and movement of soluble products of photosynthesis in phloem. (d) translocation and absorption of water and minerals from soil by roots.	1
2.	Refer to the given figure and select the option that correctly matches the labelled parts (i)-(iv) with their functions (a) - (d).  (a) Carries deoxygenated blood to the heart from the body parts (b) Carries oxygenated blood to the body parts from the heart (c) Carries deoxygenated blood to the lungs from heart (d) Carries oxygenated blood to the heart from lungs	1

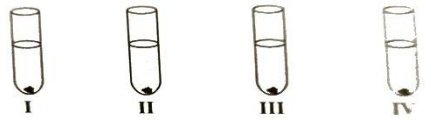
	A. (i)-(b), (ii)- (d), (iii)- (c), (iv)-(a) B. (i)-(c), (ii)- (b), (iii)-(a), (iv)-(d) C. (i)-(b), (ii)-(a), (iii)-(d), (iv)-(c) D. (i)-(d), (ii)-(c), (iii)- (b), (iv)-(a)	
3.	Select the incorrect match from: A. Auxin- Regulates tropism B. Abscisic acid- Promotes dormancy in seeds and buds C. Cytokinin- Speeds ageing in leaves D. Gibberellin- Promotes growth	1
4.	A student accidentally places her hand on a flame of candle and quickly pulls her hand. Here flame of candle is:- (a) a response (b) a stimulus (c) an impulse (d) an effector	1
5.	In a monohybrid cross between two heterozygous individuals, percentage of heterozygous individuals obtained in F_1 generation is A. 25% B. 50% C. 75% D. 100%.	1
6.	 Refer to the given food web. How many primary and secondary consumers are present in the given food web respectively? A. 2,3 B. 3,4 C. 3,2 D. 4, 3	1
7.	In the given food chain, suppose the amount of energy at fourth trophic level is 5 kJ, what will be the energy available at the producer level? Grass → Grasshopper → Frog → Snake → Hawk (a) 5 k J (b) 50 k J (c) 500 k J (d) 5000 k J	1
	The following two statements consist of two statements-Assertion (A) and Reason (R).	

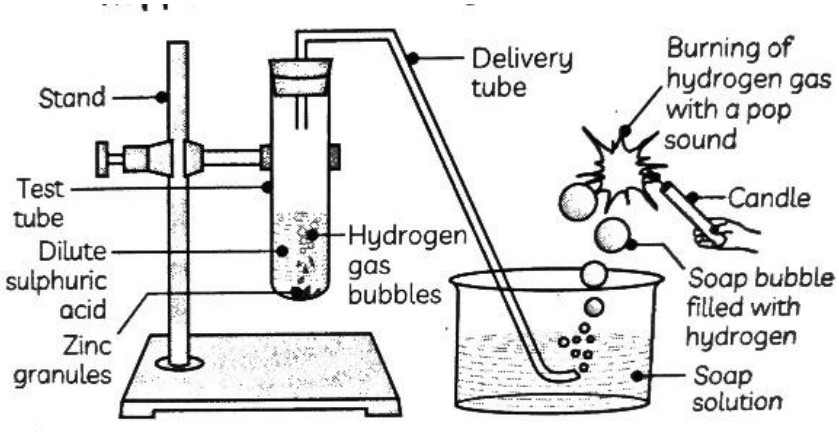
<table>
<tr><td></td><td>Answer these questions selecting the appropriate option given below:
(a) Both (A) and (R) are true and (R) is the correct explanation of (A)
(b) Both (A) and (R) are true, but (R) is not the correct explanation of (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true</td><td></td></tr>
<tr><td>8.</td><td>Assertion (A): chromosome inherited from the parents decide the sex of a child.
Reason (R): X chromosome in a male child is inherited from his father.</td><td>1</td></tr>
<tr><td>9.</td><td>Assertion (A) : Food chain is responsible for the entry of harmful chemicals in our bodies.
Reason (R): The length and complexity of food chains vary greatly.</td><td>1</td></tr>
<tr><td>10.</td><td>Name the part of the human excretory system where nephrons are found. Write the structure and function of nephrons.</td><td>2</td></tr>
<tr><td>11.</td><td>Name the movements that occur all along the gut in human digestive system. How do these help in digestion?
OR
Name the type of blood (oxygenated/ deoxygenated) transported by each of the following mentioning the path, i.e., from one organ (which place) to another (which place)

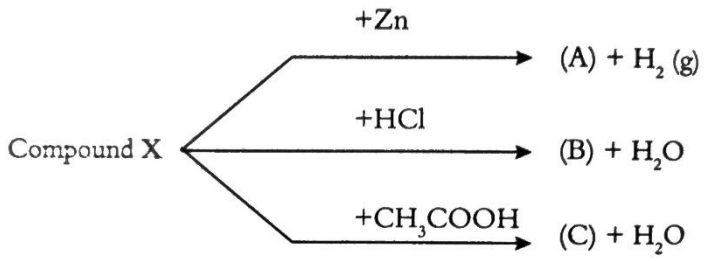
(i) Vena cava (ii) Pulmonary artery</td><td></td></tr>
<tr><td>12.</td><td>Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?</td><td>2</td></tr>
<tr><td>13.</td><td>Max saw a danger situation ,he saw a snake in the garden . Name the hormone secreted and explain the response of his body during this experience.</td><td>3</td></tr>
<tr><td>14.</td><td>Study the given data and answer the following questions:
<table><tr><th>Parental plants cross fertilized & seeds collected</th><th>F_1 (first generation off spring)</th><th>F_2 (offspring of self-pollination of F_1)</th></tr><tr><td>Male parent always bore 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?</td><td>3</td></tr>
</table>

	(iii) Express the genotype of the (a) parents and (b) F1 Progeny	
15.	Ravi had a lunch consisting of rice, dal, salad, and ghee. Help him understand the process of digestion of this meal by answering the questions below. **Attempt either subpart A or B** **A.** Which of these food items is rich in carbohydrates? Where does its digestion start and where does it get completed? Name the enzymes involved. **OR** **B.** Which of these food items contains proteins? Describe the process of its digestion from the stomach to the small intestine. **C.** Which part of the alimentary canal receives bile? What is the role of bile in digestion? **D.** In which part of the alimentary canal are the end products of digestion absorbed into the blood? Name these end products.	4
16.	A. State the changes that take place in the uterus when (i) Implantation of embryo has occurred. (ii) Female gamete is not fertilized. B. What are the effects of contraception on health and prosperity of a family? **OR** A. Explain with the help of a diagram how pollen after landing on the stigma of a flower helps male germ cell to reach the female germ cell. Label the following: ovary, female germ cell, male germ cell and pollen grain. B. What is the fate of ovary, ovule, style and sepals after fertilization?	3 + 2 = 5

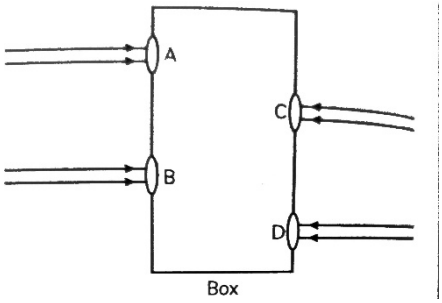
	SECTION B	
17.	Identify the correct statement about the following reaction: $2H_2S + SO_2$ -----> $2H_2O + S$ (A) H_2S is oxidising agent and SO_2 is reducing agent. (B) H_2S is reduced to sulphur. (C) SO_2 is oxidising agent and H_2S is reducing agent. (D)SO_2 is oxidised to sulphur**.**	1
18.	Match column I with column II and select the correct option from the given codes. **Column I** **Column II** **P.** A metal that reacts with steam **(i)** Potassium	1

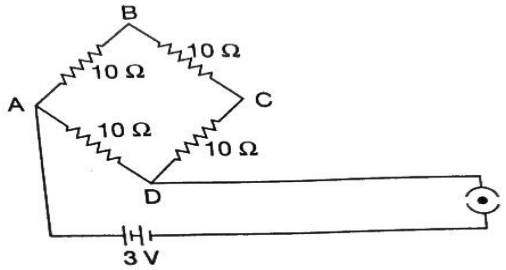
	Q. A metal that reacts only with hot water **(ii)** Gold **R.** A metal that does not even react with steam **(iii)** Magnesium **S**. A metal that reacts violently with cold water **(iv)** Aluminium (A) P – (iii), Q – (ii), R – (iv), S – (i) (B) P – (iv), Q – (iii), R – (ii), S – (i) (C) P – (iv), Q – (ii), R – (iii), S – (i) (D) P – (i), Q – (iii), R – (ii), S – (iv)	
19.	MsPooja, a science teacher took Mg, Al, Fe and Pb strips and inserted them in four test tubes I, II, III and IV respectively, each containing zinc sulphate solution, as shown in thefollowing figure:  The reaction will not occur in test tube(s) A.I only B. III and IV only C. II and IV only D. I and II only.	1
20.	Sodium hydrogen carbonate when added to acetic acid evolves a gas.Which of the following statements are true about the gas evolved? (i) It turns lime water milky. (ii) It extinguishes a burning splinter. (iii) It dissolves in a solution of sodium hydroxide. (iv) It has a pungent odour. (a)(i) and (ii) (b) (i), (ii) and (iii) (c) (ii), (iii) and (iv) (d) (i) and (iv)	1
21.	A sample of soil is mixed with water and allowed to settle. The solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue? (a) Lemon juice (b) Vinegar (c) Common salt (d) An antacid	1
22.	Reaction between X and Y forms compound Z. X loses an electron and Y gains an electron. Which of the following properties is not shown by Z? (a) Has high melting point (b) Has low melting point (c) Conducts electricity in molten state (d**)** Occurs as solid	1
23.	Solid calcium oxide reacts vigorously with water to form calcium hydroxide, accompanied by liberation of heat. This process is called slaking of lime. Calcium hydroxide dissolves in water to form a solution called lime water. Which among the following is/are true about slaking of lime and the solution formed? (i) It is an endothermic reaction.	1

	(ii) It is an exothermic reaction. (iii) The pH of the resulting solution will be more than seven. (iv) The pH of the resulting solution will be less than seven. (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (iii) and (iv)	
	The following question consist of two statements-Assertion (A) and Reason (R). Answer these questions 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, but (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):** C_2H_4 will undergo addition reaction with hydrogen. **Reason (R):** C_2H_4 is an unsaturated compound	1
25.	"Sodium chloride and washing soda both belong to the same family of salts." Justify this statement.	2
26.	A metal of colour yellowish orange, when exposed to air and moisture, undergoes oxidation and develops a greenish or bluish-green tarnish. Given below are the steps for the extraction of that metal from its ore. Write the reaction involved. (i) Roasting of metal sulphide. (ii) Reduction of metal oxide with metal sulphide. (iii) Electrolytic refining **OR** A metal with low reactivity, is found in liquid state at room temperature. Write equations to extract it from it's sulphide ore.	3
27.	1 g of solid sodium chloride is taken in a clean and dry test tube and 2 ml of conc. H_2SO_4 is added to it. If the gas evolved is tested first with dry and then with wet blue litmus paper, in which case will the litmus paper change its colour? Give reasons for your answer. What inference can be drawn about the nature of the evolved gas? Support your answer with chemical equation for the reaction**.**	3
28.	In the following schematic diagram for the preparation of hydrogen gas as shown  infigure, what would happen if following changes are made?	4

	(a) In place of zinc granules, same amount of zinc dust is taken in the test tube. (b) In place of zinc, copper turnings are taken. (c) Sodium hydroxide is taken in place of dilute sulphuric acid and the test tube is heated. **OR** Identify the compound X on the basis of the reactions given below. Also, write the name and chemical formulae of A, B and C.  	
29.	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 two atoms of hydrogen in the presence of Nickel, changes to a saturated hydrocarbon **'C'**. (i) Identify **A**. **B** and **C**. (ii) Write the chemical equations showing the conversion of **A** into **B**. (iii) What happens when compound **A** undergoes combustion? (iv) State one industrial application of hydrogenation reaction. (v) Name the products formed when compound **A** reacts with sodium. **OR** (i) With the help of diagram, show the formation of micelles, when soap is applied on oily dirt. (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. (a) In which test tube the formation of foam will be more ? Why? (b) In which test tube is a curdy solid formed? Why?	5

SECTION C

30.	Beams of light are incident through the holes A and B and emerge out of box through the holes C and D respectively, as shown in the figure. Which of the following could be inside the box?  (a) A rectangular glass slab (b) A convex lens (c) A concave less (d) A prism	1
31.	Which of the following statements are correct? (i) Sky appears blue because of scattering of blue component of sunlight by water droplets suspended in air. (ii) The light coming from far off stars to the Earth, bends towards the normal. (iii) The lower part of bi-focal lens is a concave lens. (iv) Short sightedness is corrected by concave lens which Has a negative focal length A. (i), (ii) and (iv) only B. (ii) and (iv) only C. (ii), (iii), and (iv) only D. (i), (ii), (iii) and (iv)	1
	The following question consist of two statements-Assertion (A) and Reason (R). Answer these questions 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, but (R) is not the cormet explanation of (A). (c) (A) is true, but (R) is false. (d) (A) is false, but (R) is true	
32.	**Assertion (A):** Myopic eye cannot see distant objects distinctly. **Reason (R):** For the correction of myopia converging lenses of appropriate power are prescribed by eye-surgeons**.**	1
33.	Raj focuses the beam of light coming from laser on a glass slab. Draw diagrams to show path of the ray of light when it falls (a) normally (perpendicular) on the surface of glass slab and (b) obliquely on the surface of the glass slab.	2
34.	Find out the following in the electric circuit given in the figure :- (a) Effective resistance of the network of four resistors	2

	 (b) Current drawn from the battery in the circuit. OR Write two differences between resistance and resistivity.	
35.	Rahul and Mayank argued about the position of a star in the sky. Rahul was saying that the position of star seen by us is it's true position but Mayank disagreed by saying that the position of a star as seen by us is not it's true position. Who do you think is correct? Justify your answer.	3
36.	A household uses the following electric appliances:- (i) Two electric fans of rating 80 W each for twelve hours each day. (ii) Six electric tubes of rating 18 W each for six hours each day. Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is ₹ 6.00.	3
37.	State the right-hand thumb rule and Fleming's left-hand rule.	3
38.	Many optical instruments consist of a number of lenses. They are combined to increase the magnification and sharpness of the image. The net power (P) of the lenses placed in contact is given by the algebraic sum of the powers of the individual lenses P1,P2,P3… as P= P1 + P2 + P3… This is also termed as the simple additive property of the power of lens, widely used to design lens systems of cameras, microscopes and telescopes. These lens systems can have a combination of convex lenses and also concave lenses. **(a)** What is the nature (convergent/divergent) of the combination of a convex lens of power + 4D and a concave lens of power-2D? **(b)** Calculate the focal length of a lens of power-2.5 D. **(c)** Draw a ray diagram to show the nature and position of an image formed by a convex lensof power + 0.1 D, when an object is placed at a distance of 20 cm from its optical centre. **OR** Differentiate real image and virtual image?	4
39.	Three incandescent bulbs of 100 W each are connected in series in an electric circuit. In another set, three bulbs of the same power are connected in parallel to the same source.	5

	(a) Will the bulb in the two circuits glow with the same brightness? Justify your answer. (b) Now, let one bulb in both the circuits get fused. Will the rest of the bulbs continue to glow in each circuit? Give reason. OR (a) List the factors on which the resistance of a uniform cylindrical conductor of a given material depends. (b) The resistance of a wire of 0.01 cm radius is 10 ohm. If the resistivity of the wire is 50×10^{-8} Ω m, find the length of this wire	