KENDRIYA VIDYALAYA SANGATHAN MUMBAI REGION

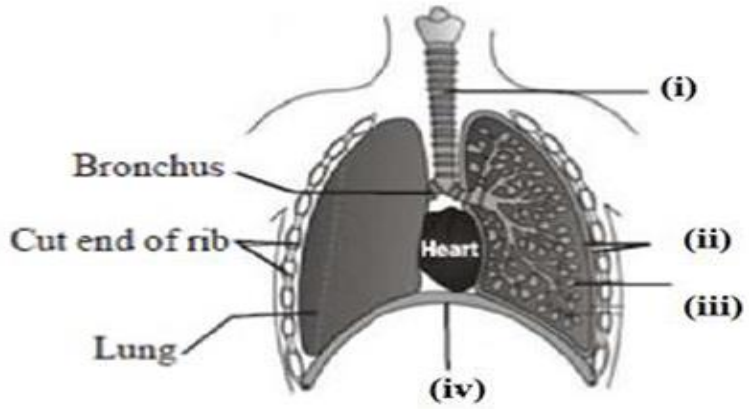
PRE-BOARD I EXAMINATION 2025-26

SCIENCE (086) **Max. Marks: 80**
CLASS- X **Time Allowed: 3 hours**

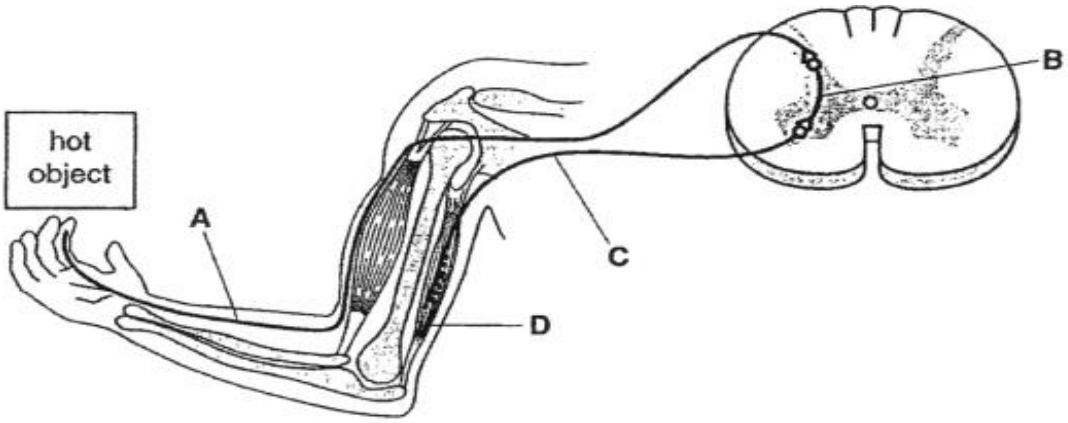
General Instructions:

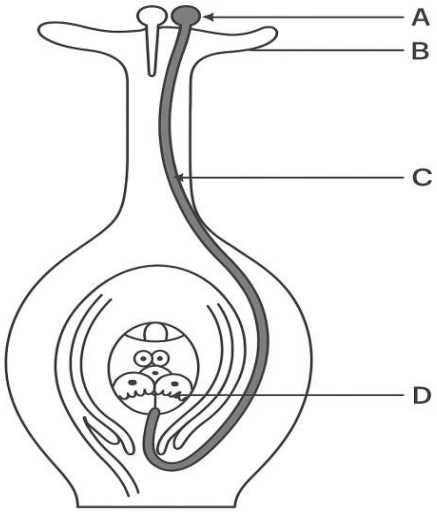
(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

(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.

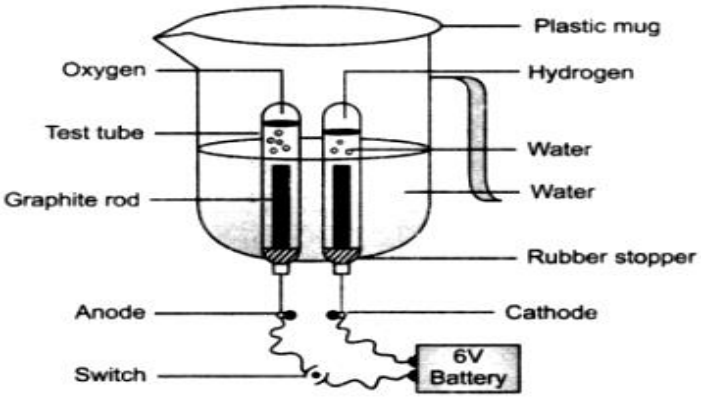
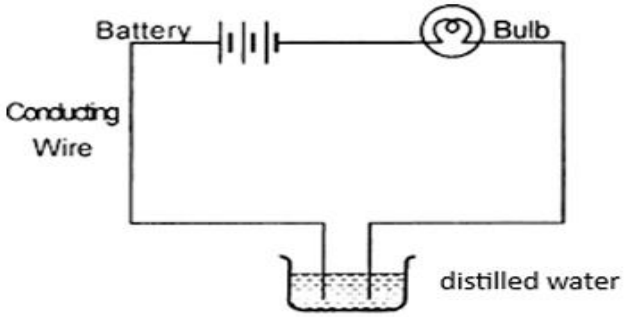
	Section - A	**Marks**
1.	An organism which breaks down the food material outside the body and then absorbs it is (a) A plant parasite, Cuscuta (b) An animal parasite, Tapeworm (c) A bacterium, Rhizobium (d) A fungi, Rhizopus	1
2.	Carefully study the diagram of the human respiratory system with labels (i), (ii), (iii) and (iv). Select the option which gives correct identification and main function and /or characteristic.  (a) Trachea (i): It is supported by bony rings for conducting inspired air. (b) Ribs (ii): When we breathe out, ribs are lifted. (c) Alveoli (iii): Thin-walled sac like structures for exchange of gases. (d) Diaphragm(iv): It is pulled up when we breathe in.	1
3.	There was a cerebellar dysfunction in a patient. Which of the following activities will get disturbed in this patient as a result of this? (a) Salivation (b) Hunger control (c) Posture and balance (d) Regulation of blood pressure	1
4.	Receptors are usually located in sense organs. Gustatory receptors are present in : (a) tongue (b) nose (c) eye (d) ear	1
5.	Height of a plant is regulated by: (a) DNA which is directly influenced by growth hormone. (b) Genes which regulate the proteins directly. (c) Growth hormones under the influence of the enzymes coded by a gene.	1

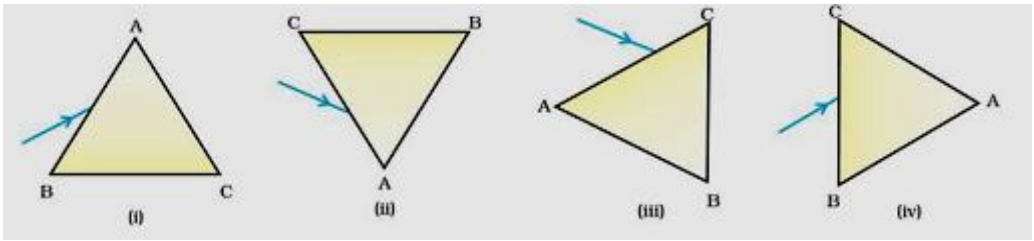
	(d) Growth hormones directly under the influence a gene.	
6.	Identify the food chain in which the organisms of the second trophic level are missing: (a) Grass, goat, lion (b) Zooplankton, phytoplankton, small fish, large fish (c) Tiger, grass, snake, frog (d) Grasshopper, grass, snake, frog, eagle	1
7.	Some wastes are given below: (i) Garden waste (ii) Ball point pen refills (iii) Empty medicine bottles made of glass (iv) Peels of fruits and vegetables (v) Old cotton shirt The non-biodegradable wastes among these are: (a) (i) and (ii) (b) (ii) and (iii) (c) (i), (iv) and (v) (d) (i), (iii) and (iv)	1
	The following two questions consist 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.	
8.	**Assertion (A):** Testes lie in penis outside the body. **Reason (R):** Sperms require temperature lower than the body temperature for development.	1
9.	**Assertion (A):** If the lions are removed from a food chain it will not affect the food chain, however if the plants are removed from a food chain it will disturb the ecosystem. **Reason (R):** Plants are producers who can make food using sunlight, while lions are consumers.	1
10.	Name the substances other than water that are reabsorbed during urine formation. What are the two parameters that decide the amount of water that is reabsorbed in the kidney?	2
11.	**<u>Attempt either option A or B</u>.** **A.** List the steps for the synthesis of glucose by the plants. What special feature is found in desert plants related to this process? **OR** **B.** Explain the role of the following enzymes in the process of digestion of food in humans: (i) Salivary amylase (ii) Pepsin (iii) Trypsin (iv) Lipase	2
12.	Study the food chain given below and answer the questions that follow:	2

	 a) If the amount of energy available at the third trophic level is 100 joules, then how much energy will be available at the producer level? Justify your answer. b) Is it possible to have 2 more trophic levels in this food chain just before the fourth trophic level? Justify your answer.	
13.	Study the diagram of reflex arc and answer the following questions:  (i) Identify the parts labelled as A, B, C, and D. (ii) Reflex arcs have evolved in animals. Why?	3
14.	Explain the process of breakdown of glucose in a cell.	3
15.	Sahil performed an experiment to study the inheritance pattern of genes. He crossed tall pea plants (TT) with short pea plants (tt) and obtained all tall plants in F1 generation. **<u>Attempt either subpart C or D.</u>** A. What will be set of genes present in the F1 generation? B. Give reason why only tall plants are observed in F1 progeny. C. When F1 plants were self - pollinated, a total of 800 plants were produced. How many of these would be tall, medium height or short plants? Give the genotype of F 2 generation. **OR** D. When F1 plants were cross - pollinated with plants having tt genes, a total of 800 plants were produced. How many of these would be tall, medium height or short plants? Give the genotype of F 2 generation.	4
16.	(a) List two reasons for appearance of variations among the progeny formed by sexual reproduction.	5(2+3)

	(b) Study the diagram given below and answer the following questions:  (i) Name the part marked 'A' in the diagram given. (ii) How does 'A' reaches part 'B'? (iii) State the importance of part 'C'. **OR** (a) Certain specialised cells in animals called stem cells have the ability to divide and differentiate into different cell types. This helps in the replacement of a damaged organ. Name and explain two methods of asexual reproduction that are similar to stem cells and occur mostly in multicellular organisms. (b) Identify TWO pairs of reproductive organs in males and females that are functionally similar to each other. Justify.	
	Section – B	
17.	$Zn + 2CH_3COOH \longrightarrow (CH_3COO)_2Zn + H_2$ The above reaction is a (a) Decomposition reaction (b) Displacement reaction (c) Double displacement reaction (d) Combination reaction	1
18.	Four solutions, namely glucose, alcohol, hydrochloric acid and sulphuric acid filled in four separate beakers are connected one by one in an electric circuit with a bulb. The solutions in which the bulb will glow when current is passed are : (a) Glucose and alcohol (b) Alcohol and hydrochloric acid (c) Glucose and sulphuric acid (d) Hydrochloric acid and sulphuric acid	1

19.	Match column I with column II and select the correct option using the given Codes: <table><tr><th>Column I</th><th>Column II</th></tr><tr><td>a. A metal that forms amphoteric oxides</td><td>(i) Ga</td></tr><tr><td>b. A metal which melts when kept on our palm</td><td>(ii) Au</td></tr><tr><td>c. A metal that reacts with nitric acid</td><td>(iii) Al</td></tr><tr><td>d. A metal which cannot displace hydrogen from acids</td><td>(iv) Mn</td></tr></table>(a) a – (ii), b – (i), c – (iii), d – (iv) (b) a – (iii), b – (i), c – (iv), d – (ii) (c) a – (iv), b – (ii), c – (iii), d – (i) (d) a – (iii), b – (ii), c – (i), d – (iv)	1
20.	A metal and a non-metal that exists in liquid state at room temperature are respectively: (a) Bromine and Mercury (b) Mercury and Iodine (c) Mercury and Bromine (d) Iodine and Mercury	1
21.	Anita added a drop each of diluted acetic acid and diluted hydrochloric acid on pH paper and compared the colours. Which of the following is the correct conclusion? (a) pH of acetic acid is more than that of hydrochloric acid. (b) pH of acetic acid is less than that of hydrochloric acid. (c) Acetic acid dissociates completely in aqueous solution. (d) Acetic acid is a strong acid	1
22.	When excess of carbon dioxide is passed through lime water, the milkiness disappears because (a) water soluble calcium carbonate converts to water soluble calcium bicarbonate. (b) insoluble calcium carbonate converts to water soluble calcium bicarbonate. (c) water soluble calcium carbonate converts to insoluble calcium bicarbonate. (d) insoluble calcium carbonate converts to insoluble calcium bicarbonate.	1
23.	The number of single and double bonds present in a molecule of benzene (C_6H_6) respectively, are : (a) 6 and 6 (b) 9 and 3 (c) 3 and 9 (d) 3 and 3	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):** If the first member of a homologous series is Methanal, its third member will be Propanal. **Reason (R):** All the members of a homologous series show similar chemical properties.	1
25.	Explain why we cannot have isomers of first three members of Alkane series?	2

26.	**Attempt either option A or B.** A. Amrita electrolysed distilled water using the set-up shown in figure 1. She was expecting two gases to be evolved at the anode and cathode respectively  Suddenly, she realised that the bulb in the circuit did not glow when she used distilled water (figure 2)  Fig. 2 After this realization, she added a substance to the distilled water for electrolysis to take place. **Answer the following questions based on the information given above:** (i) Which gas was she expecting to be formed at the anode and which one at the cathode respectively? (ii) Why did the bulb not glow when Amrita passed electricity through distilled water? (iii) Which substance was added by Amrita to distilled water to get the expected result? **OR** B. The domes of many building in Europe are made of copper. These domes now appear greenish in colour. (i) Why do the domes appear greenish though copper is orange-red in colour? (ii) In your opinion, should the copper domes be replaced by iron domes to overcome the problem of change of colour of copper domes? (iii) Domes used to be made from thin sheets of metals. Why did the ancient architects use copper to make domes?	3
27.	(i) Suggest a safe procedure of diluting a strong concentrated acid. (ii) Name the salt formed when sulphuric acid is added to sodium hydroxide and write its pH. (iii) Dry HCl gas does not change the colour of dry blue litmus paper. Why?	3

28.	The metals produced by various reduction processes are not very pure. They contain impurities, which must be removed to obtain pure metals. The most widely used method for refining impure metal is electrolytic refining. (i) What is the cathode and anode made of in the refining of copper by this process? (ii) Name the solution used in the above process and write its formula. (iii) How copper gets refined when electric current is passed in the electrolytic cell? **OR** (iii) You have two beakers A and B containing copper sulphate solution. What would you observe after two hours if you dip a strip of zinc in beaker A and a strip of silver in beaker B? Give reasons for your observations in each case.	4
29.	An organic compound 'X' with molecular formula C_2H_6O on reacting with acidified $K_2Cr_2O_7$ gives an organic compound 'Y'. X reacts with Y on warming in the presence of conc. H_2SO_4 to give a sweet smelling compound 'Z'. (i) Identify X, Y and Z. (ii) Write the chemical equations for the reactions involved in both cases. (iii) State the role of – (a) acidified $K_2Cr_2O_7$ in the conversion of X to Y (b) Conc. H_2SO_4 in the reaction of X and Y. (iv) Name the reaction, which occurs when Z reacts with an alkali. **OR** (i) Write the name and structure of an organic compound 'X' having two carbon atoms in its molecule and its name is suffixed with '-ol'. (ii) What happens when 'X' is heated with excess conc. Sulphuric acid at 443 K? Write chemical equation for the reaction stating the conditions for the reaction. Also state the role played by conc. Sulphuric acid in the reaction. (iii) Name and draw the electron dot structure of hydrocarbon produced in the above reaction.	5
	Section – C	
30.	Consider these indices of refraction: glass: 1.52; air: 1.0003; water: 1.333. Based on the refractive indices of three materials, arrange the speed of light through them in decreasing order. (a) The speed of light in water > the speed of light in air > the speed of light in glass. (b) The speed of light in glass > the speed of light in water > the speed of light in air. (c) The speed of light in air > the speed of light in water > the speed of light in glass. (d) The speed of light in glass > the speed of light in air > the speed of light in water.	1
31.	A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in below Figure. In which of the following diagrams, after dispersion, the third colour from the top of the spectrum corresponds tothe colour of the sky?  A. (i) B. (ii) C. (iii) D. (iv)	1

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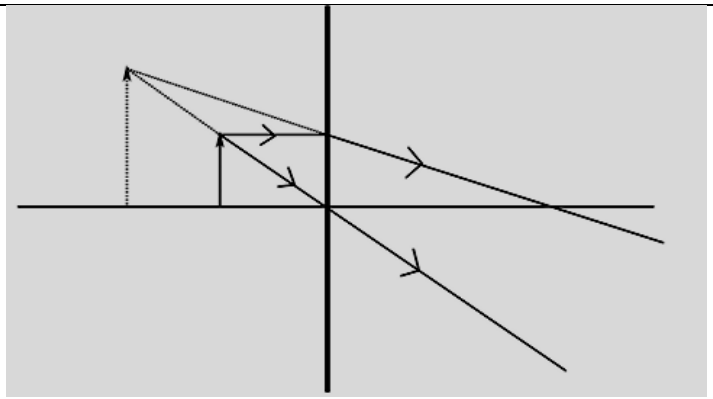
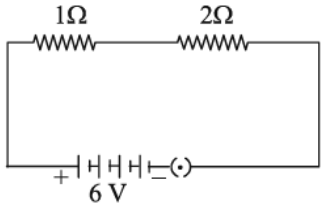
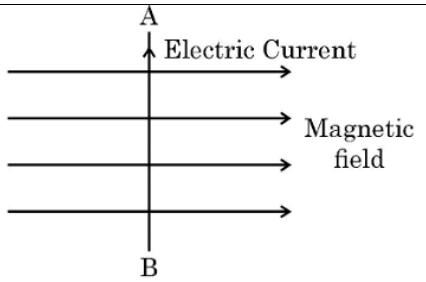
32.	**Assertion (A):** The rainbow is a natural spectrum of sunlight in the sky. **Reason (R):**Rainbow is formed in the sky when the sun is overhead and water droplets are also present in air.	1
33.	 The above figure shows the formation of an image by a lens shown by a thick line. Analyse the figure and answer the following questions. (i) What is the type of lens used? (ii) What is the nature of the image? (iii) If the image is formed at a distance of 30 cm from the lens and the image is twice the size of the object, then where is the object placed?	2
34.	**<u>Attempt either option A or B.</u>** **A.** Show how you would connect three resistors each of resistance 6 Ω, so that the combination has a resistance of 9 Ω. Also justify your answer. **OR** **B.** In the given circuit calculate the power consumed in watts in the resistor of 2 Ω: 	2
35.	A person is suffering from an eye defect in which the far point of the eye is nearer than infinity. Identify the defect. List two main causes of this defect. Draw a ray diagram to show how this defect is corrected by using a suitable lens.	3
36.	(a) State Fleming's left hand rule. Apply this rule to determine the direction of force experienced by a straight current carrying conductor AB placed in a uniform magnetic field as shown.	3

	 (b) What will happen to an electron that enters in the same magnetic field in the same direction in which the current is flowing in the conductor AB? Give reason to justify your answer.	
37.	What is a solenoid? When does a solenoid behave as a magnet? Draw the pattern of the magnetic field produced inside it showing the directions of the magnetic field lines.	3
38.	A highly polished surface such as a mirror reflects most of the light falling on it. In our daily life, we use two types of mirrors plane and spherical. The reflecting surface of spherical mirrors may be curved inwards or outwards. In concave mirrors, reflection takes place from the inner surface, while in convex mirrors reflection takes place from the outer surface. (a) Define the principal focus of a concave mirror. (b) A ray of light is incident on a concave mirror, parallel to its principal axis. If this ray after reflection from the mirror passes through the principal axis from a point at a distance of 10 cm from the pole of the mirror, find the radius of curvature of the mirror. (c) An object is placed at a distance of 10 cm from the pole of a convex mirror of focal length 15 cm. Find the position of the image. **OR** (c) A mirror forms a virtual, erect and diminished image of an object. Identify the type of this mirror. Draw a ray diagram to show the image formation in this case.	4
39.	(a) Define electric power and state its SI unit. The commercial unit of electrical energy is known as 'unit'. Write the relation between this 'unit' and joule. (b) In a house, 2 bulbs of 50 W each are used for 6 hours daily and an electric geyser of 1 kW is used for 1 hour daily. Calculate the total energy consumed in a month of 30 days and its cost at the rate of ₹8.00 per kWh. **OR** (a) Draw a schematic diagram of a circuit consisting of a battery of four dry cells of 1.5 V each, a 2 Ω resistor, a 6 Ω resistor, a 16 Ω resistor and a plug key all connected in series. Put an ammeter to measure the current in the circuit and a voltmeter across the 16 Ω resistor to measure the potential difference across its two ends. Use Ohm's law to determine: (i) ammeter reading, and (ii) voltmeter reading when the key is closed. (b) A 4 Ω resistance wire is doubled on it. Calculate the new resistance of the wire.	5

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