SET-I

KENDRIYA VIDYALAYA SANGATHAN, RO SILCHAR

PRE - BOARD 2025-26

SUBJECT: SCIENCE (CODE:086)

CLASS X

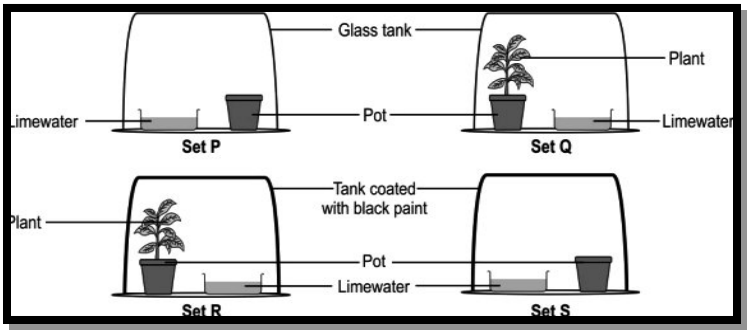
MAX MARKS: 80 **TIME ALLOWED: 3 HRS**

General Instructions:

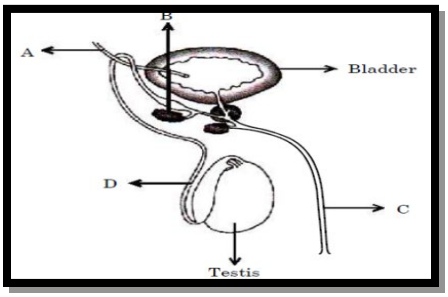
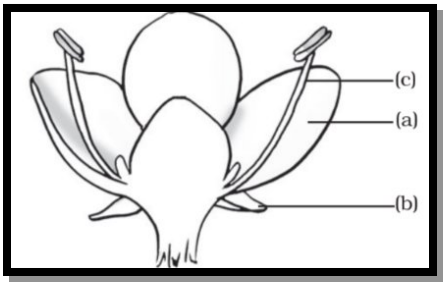
Read the following instructions carefully and strictly follow them:

1. This question paper consists of 39 questions in 3 Sections. **Section A is Biology, Section B is Chemistry and Section C is Physics.**

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

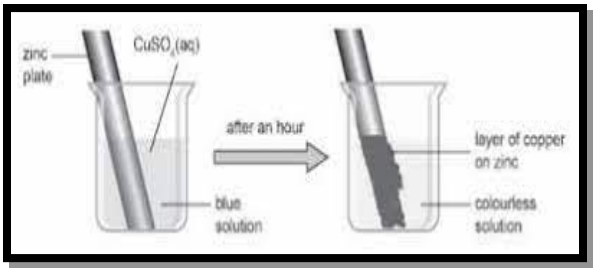
<table>
<tr><th colspan="2">SECTION - A BIOLOGY</th><th>Marks</th></tr>
<tr><td>1.</td><td>In the human respiratory system, the path taken by air when we breathe in is:
(a)Nostrils ------> Larynx ------> Trachea ------> Pharynx ------> Alveoli
(b)Nostrils ------>Trachea ------> Larynx ------>Pharynx ------>Alveoli
(c)Nostrils ------>Pharynx------>Larynx------>Trachea------>Alveoli
(d)Nostrils------>Larynx------>Pharynx------>Trachea------>Alveoli</td><td>1</td></tr>
<tr><td>2.</td><td>Lime water turns cloudy in the presence of a gas which is a by-product of respiration. Shown below are four setups kept in sunlight for 24 hours. In which setup is lime water expected to be the cloudiest?
(a) Setup P (b)Setup Q
(c)Setup R (d)Setup S
 
</td><td>1</td></tr>
<tr><td>3.</td><td>Walking in a straight line and riding a bicycle are activities controlled by a specific part of the brain. Choose the correct location and the name of this brain part from the given table.
<table>
<tr><td></td><td>Parts of the brain</td><td>Name</td></tr>
<tr><td>(a)</td><td>Forebrain</td><td>Cerebrum</td></tr>
<tr><td>(b)</td><td>Midbrain</td><td>Hypothalamus</td></tr>
<tr><td>(c)</td><td>Hindbrain</td><td>Cerebellum</td></tr>
<tr><td>(d)</td><td>Hindbrain</td><td>Medulla</td></tr>
</table></td><td>1</td></tr>
<tr><td>4.</td><td>Which one of the following statement is true for Hydra, Amoeba and Spirogyra?
(a)They are multicellular (b)They are unicellular
(c)They reproduce sexually (d)They reproduce asexually</td><td>1</td></tr>
<tr><td>5.</td><td>A homozygous dominant guinea pig with black fur is crossed with a homozygous guinea 1 pig with white fur. The F_1 generation is crossed with itself. What percentage of F_2 generation is expected to show white fur coat?
(a)25% (b)50% (c)75% (d)100%</td><td>1</td></tr>
<tr><td>6.</td><td>A cross between two tall pea plants resulted in offsprings having a few dwarf plants. The gene-</td><td>1</td></tr>
</table>

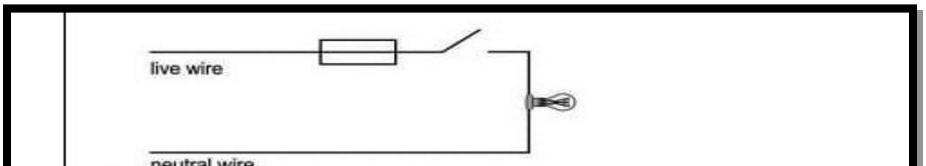
	combination of the parental plants must be (a)Tt and Tt (b)Tt and tt (c)TT and tt (d)TT and Tt	
	For questions number 7,two statements are given - one labelled as Assertion (A) and the other labelled as Reason (R).Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A) (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion(A) (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
7.	**Assertion (A)**: A geneticist crossed a pea plant having violet flowers with a pea plant having white flowers; he got all violet flowers in first generation. **Reason(R)**: White colour gene is not passed on to next generation.	1
8.	(i)A product is formed in the cytoplasm of our muscles due to the breakdown of glucose when there is a lack of oxygen. Name the product and also mention the effect of buildup of this product. (ii)Differentiate between fermentation in yeast and aerobic respiration on the basis of end products formed.	2
9.	Proteinuria is a condition in which significant amounts of protein can be detected in urine. Which process in the nephron is likely to be affected causing proteinuria? Justify.	2
10.	Answer the following. (i)Name the endocrine gland associated with brain. (ii)Which gland secretes digestive enzymes as well as hormones? (iii)Name the endocrine gland associated with kidneys. (iv)Which endocrine gland is present in males, but not in females? Or Answer the following. (i)Which hormone is responsible for the changes noticed in females at puberty? (ii)Dwarfism results due to deficiency of which hormone? (iii)Blood sugar level rises due to deficiency of which hormone? (iv)Iodine is necessary for the synthesis of which hormone?	2
11.	Study the food chain given below and answer the questions that follow: Leaf --> Caterpillar ---> Chameleon --> Snake --> mongoose (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.	2
12.	Human beings exhibit, 'double circulation' during which blood is passed through the lungs and heart. (i) State the route of the first and the second circulation through the chambers of the heart and explain the usefulness of such circulation in humans. (ii) Name the blood vessels that: (a) the heart carry oxygenated blood from the lungs to the heart (b) carry deoxygenated blood from the heart to the lungs	3
13.	A gas 'X' which is a deadly poison is found at the higher levels of atmosphere and performs an essential function. Name the gas and write the function performed by this gas in the atmosphere. Which chemical is linked to the decrease in the level of this gas? What measures have been taken by an international organization to check the depletion of the layer containing this gas?	3

14.	Based on the given diagram answer the questions given below. (i) Label the parts A, B, C and D. (ii)Name the hormone secreted by testis and mention it's any one role. (iii)State the functions of B and C in the process of reproduction. Or In the diagram of a bisexual flower given as figure, (i)Draw the missing part and label the parts marked (a), (b) and (c). Also, label the missing part that you draw. (ii)Write the post fertilization changes that occur in a flower. (iii)Justify the statement ``Pollination may occur without fertilization, but fertilization will not take place without pollination.''  	5
15.	The most obvious outcome of the reproductive process is the generation of individuals of similar design, but in sexual reproduction they may not be exactly alike. The resemblances as well as differences are marked. The rules of heredity determine the process by which traits and characteristics are reliably inherited. Many experiments have been done to study the rules of inheritance. (a)Why an offspring of a human being is not a true copy of his parents in sexual reproduction? (b) While performing experiments on inheritance in plants, what is the difference between F1 and F_2 generation? (c)Why do we say that variations are useful for the survival of a species over time? OR (c)Study Mendel's cross between two plants with a pair of contrasting characters. RRYY X rryy Round Yellow Wrinkled Green He observed 4 types of combinations in F_2 generation. Which of these were new combinations? Why do new features which are not present in the parents, appear in F_2 generation? **OR** Sex of an individual is determined by different factors in various species. Some animals rely entirely on the environmental cues, while in some other animals the individuals can change their sex during their life time indicating that sex of some species is not genetically determined. However in human beings, the sex of an individual is largely determined genetically. (a)In what way the sex chromosomes X and Y different in size? Name the mismatched pair of sex chromosome in humans. (b)Write the number of pair/pairs of sex chromosomes present in human beings. In which one of the parent (male/female) perfect pair/pairs of sex chromosome are present? (c)Citing two examples, justify the statement "Sex of an individual is not always determined genetically". OR (c)Draw a flow chart to show that sex is determined genetically in human beings.	4
	SECTION B CHEMISTRY	
16	The colour of the solution observed after 30 minutes of placing zinc metal to copper sulphate	1

.	solution is (a)Blue (b)Colourless (c)Dirty green (d)Reddish green	
17.	Which of the following is a redox reaction, but not a combination reaction? (a) $C+O_2 \rightarrow CO_2$ (b) $2H_2+O_2 \rightarrow 2H_2O$ (c) $2Mg+O_2 \rightarrow 2MgO$ (d) $Fe_2O_3+3CO \rightarrow 2Fe+3CO_2$	1
18.	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) lt has a pungent odor. (a) (i) & (ii) (b) (i) & (iv) (c) (i). (ii) & (iii) (d) All of these	1
19.	Payal has to arrange the following in DECREASING order of hydroxide ion concentration. Wine (pH 4.0), milk of magnesia (pH 10.5), blood (pH 7.4). Which of the following arrangements is correct? (a)wine > milk of magnesia > blood (b)blood > milk of magnesia > wine (c)milk of magnesia > blood > wine (d)wine > blood > milk of magnesia	1
20.	Given below are the reactions involving metals *P*, *Q, R* and *S* and their salt solutions in water. Metal *P* salt solution +*Q*→ Metal *Q* salt solution +*P* Metal *Q* salt solution +*R*→ Metal *R* salt solution +*Q* Metal S salt solution +*Q*→ Metal *Q* salt solution +*S* Metal *P* salt solution +*S*→ No reaction Which metal is the MOST reactive? (a)P (b)Q (c)R (d)S	1
21.	Which one of the following properties of Carbon is not responsible for its formation of large number of compounds? (a)Tetravalency (b)Isomerism (c)Allotropy (d)Catenation	1
	For questions number 7,two statements are given - one labelled as Assertion (A) and the other labelled as Reason (R).Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below. (A)Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A) (B)Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion(A) (C)Assertion (A) is true, but Reason (R) is false. (D)Assertion (A) is false, but Reason (R) is true.	
22.	Assertion(A): A white washed wall develops a coating of calcium carbonate after a few days. Reason(R):Calcium oxide on the wall reacts slowly with carbon dioxide in the air.	1
23.	Assertion(A): If the pH inside the mouth decreases below 5.5,the decay of tooth enamel begins Reason(R): The bacteria present in mouth degrades the sugar and left over food particles and produce acids that remains in the mouth after eating.	1
24.	A metal M does not liberate hydrogen from acids but reacts with oxygen to give a black colour product. Identify M and black coloured product and also explain the reaction of M with oxygen.	2
25.	State giving reason the reduction process to obtain the following metals from their compounds: (i) Mercury (ii)Copper (iii) Sodium Or State giving reason for the change in appearance observed when each of the following metal is	3

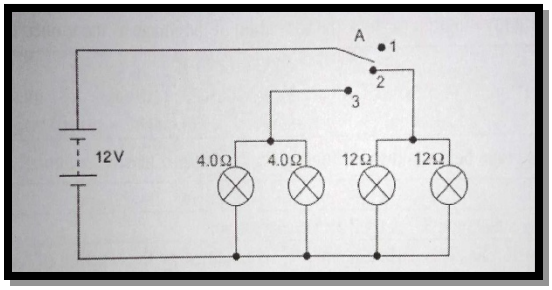
	exposed to atmospheric air for some time: (i)Silver (ii)Copper (iii)Iron	
26.	Write the balanced chemical equation for the following and identify the type of reaction in each case. (i) Potassium bromide(aq) + Barium iodide (aq)→ Potassium iodide (aq)+Barium bromide(s) (ii) Zinc carbonate(s) → Zinc oxide(s) + Carbon dioxide(g) (iii) Magnesium(s) + Hydrochloric acid(aq) → Magnesium chloride (aq)+ Hydrogen (g)	3
27.	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'. (i) Identify A, B and C. (ii) Write the chemical equations showing the conversion of A into B. (iii) What happens when compound C undergoes combustion? (iv) State one industrial application of hydrogenation reaction. (v) Name the products formed when compound A reacts with sodium. Or (i)State the litmus test to distinguish between an alcohol and a carboxylic acid. (ii)Give the equation for the reaction of a carboxylic acid with an alcohol. State the condition for the reaction and name the product formed. What is this reaction known as? (iii)Write a reaction which is reverse of this reaction? Mention the conditions required for the reaction. Name and write the use of this reaction.	5
28.	Reena immersed a zinc plate in an aqueous solution of copper sulphate . She noticed a thick layer of copper on the surface of the zinc plate after half an hour. (i)What should Reena have done to make the reaction faster? (ii)$2Al + 3H_2O \rightarrow Al_2O_3 + X$ What is X in the reaction? (iii)Will any reaction take place when a copper plate is immersed in an aqueous solution of zinc suphate.Why or why not? Explain the reason behind this? Or What makes gold exist in free state in nature?	4
	SECTION C PHYSICS	
29.	An electric bulb is rated 220 V and 100 W.What is the resistance of the bulb? (a) 484 ohm (b)476 ohm (c)444 ohm (d)440 ohm	1
30.	The maximum resistance which can be made using four resistors, each of resistance ½ ohm is (a)2 ohm (b)1 ohm (c)2.5 ohm (d)8 ohm	1
31.	Which circuit	1



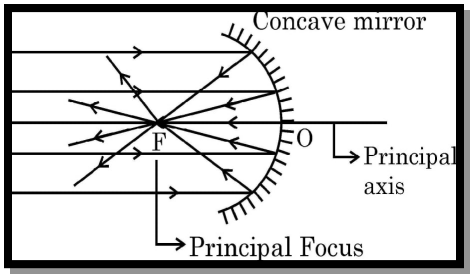


	shows the correct and safe positions for the fuse and the switch? (a) (b) (c) (d)	
32.	Force on a current carrying conductor in a magnetic field depends on (a)direction of current (b)direction of magnetic field (c)Both (a) and (b) (d)length of the wire	1
	For questions number 7,two statements are given - one labelled as Assertion (A) and the other labelled as Reason (R).Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion(A) (B) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion(A) (C) Assertion (A) is true, but Reason (R) is false. (D) Assertion (A) is false, but Reason (R) is true.	
33.	Assertion(A): The magnetic field lines around a current carrying straight wire do not intersect each other. Reason(R): The magnitude of the magnetic field produced at a given point increases as the current through the wire increases.	1
34.	White light is passed through a prism to yield a spectrum. (a) The ray of which color will show the maximum angle of deviation and which one will show the least angle of deviation? (b) A blue-coloured ray is passed through a glass prism. What will be the colour of the emergent ray? Justify your answer.	2

	Or Tina was star gazing. She observed celestial objects P and Q. They were visible brightly in the night sky. She concluded that one was a star and the other was a planet. If these celestial objects P and Q were to be observed from the moon, would Tina be able to distinguish them as a star and a planet? Why or Why not?	
35.	A student wants to project the image of a candle flame on the walls of school laboratory by using a lens. (i)Which type of lens should he use and why? (ii)At what distance in terms of focal length F of the lens should he place the candle flame, so as to get (a) A magnified image (b) A diminished image respectively, on the wall?	3
36.	Define the term absolute refractive index of a medium. Refractive index of water with respect to air is 1.33 and that of diamond is 2.42. (A) In which medium does the light move faster, water or diamond? (B) What is the refractive index of diamond with respect of water?	3
37.	(i) A straight cylindrical conductor is suspended with its axis perpendicular to the magnetic field of a horse-shoe magnet. The conductor gets displaced towards left when a current is passed through it. What will happen to the displacement of the conductor if the (1) Current through it is increased? (2) Horse-shoe magnet is replaced by another stronger horse-shoe magnet? (3) Direction of current through it is reversed? (ii) Name and state the rule for determining the direction of force on a current carrying conductor in a magnetic field	3
38.	Vinita and Ahmed demonstrated a circuit that operates the two headlights and the two sidelights of a car, in their school exhibition. Based on their demonstrated circuit, answer the following questions. (i) State what happens when switch A is connected to (a) Position 2 (b) Position 3 (ii) Find the potential difference across each lamp when lit. (iii) Calculate the current- (a) in each 12 ohm lamp when lit. (b) In each 4 ohm lamp when lit. Or (i)An air conditioner consumes energy at a rate of 2200 W when it operates at 16 degree Celsius and 1540 W when it operates at 25 degree Celsius. If the source voltage is 220V,calculate the current and resistance in each case. (ii)An electric heater is designed to operate on a mains voltage of 220 V.It consumes 4.4 units of electrical energy in 10 hours. Calculate: (a)the power rating of the water heater (b)the resistance of the water heater.	5



39 ..	Hold a concave mirror in your hand and direct its reflecting surface towards the sun. Direct the light reflected by the mirror on to a white card-board held close to the mirror. Move the card-board back and forth gradually until you find a bright, sharp spot of light on the board. This spot of light is the image of the sun on the sheet of paper; which is also termed as 'Principal Focus' of the concave mirror. (a) List two applications of concave mirror. (b) If the distance between the mirror and the principal focus is 15 cm, find the radius of curvature of the mirror. (c) Draw a ray diagram to show the type of image formed when an object is placed between pole and focus of a concave mirror. Or An object 10 cm in size is placed at 100 cm in front of a concave mirror. If its image is formed at the same point where the object is located, find (a) Focal length of the mirror, (b) Magnification of the image formed. **OR** A student took three concave mirrors of different focal lengths and formed the experiment to see the image formation by placing an object in different distances with these mirrors as shown in the following table: (a)List two properties of the image formed in Case I. (b)In which one of the cases given in the table the mirror will form real image of same size and why? (c)Name the type of mirror used by dentists. Give reason on why do they use such type of mirrors. OR (c)Look at the table and identify the situation (object distance and focal length) which resembles the situation in which concave mirrors are used as shaving mirrors? Draw a ray diagram to show the image formation in this case.	4



Case no.	Object distance	Focal length
I	**45 cm**	**20 cm**
II	**30 cm**	**15 cm**
III	**20 cm**	**30 cm**

****