HALF YEARLY EXAMINATION (2024-25)

CLASS X

SCIENCE

Time: 3 Hours **M.M 80**

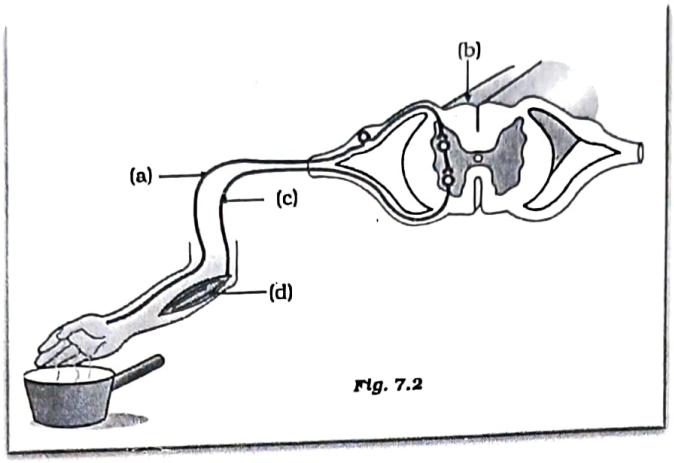
General Instructions:

- *This question paper consists of 39 questions in 5 sections.*
- *All questions are compulsory. However, an internal choice is provided in some questions.*
- *Section A consists of 20 objective type questions carrying 01 mark each.*
- *Section B consists of 6 Very Short type questions carrying 02 marks each*
- *Section C consists of 7 Short Answer type questions carrying 03 marks each.*
- *Section D consists of 3 Long Answer type questions carrying 05 marks each.*
- *Section E consists of 3 Cased Based Question carrying 04*

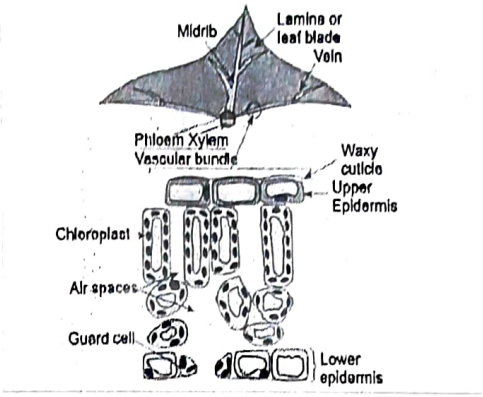
SECTION A (MULTIPLE CHOICE QUESTIONS)		
S.NO		**MARKS**
1	Which of the following is a physical property of metals? (a) Brittle (b) Poor conductors of heat and electricity (c) Malleable (d) Non-lustrous	1
2	Although metals form basic oxides, which of the following metals form an amphoteric oxide? (a) Na (b) Ca (c) Al (d) Cu	1
3	When Ca reacts with dil HCl the metal floats above the acid. The reason for observation is (a) Ca is lighter metal than dil HCl (b) Ca reacts with dil HCl to produce H_2 gas which helps in floating. (c) Ca reacts with dil HCl to produce N_2 gas which helps in floating. (d) Ca reacts with dil HCl to produce CO_2 gas which helps in floating.	1
4	$Na_2CO_3.10H_2O$ is known as – (a) Baking soda (b) Baking powder (c) Washing soda (d) Bleaching powder	1
5	What happens when a solution of an acid is mixed with a solution of a base in a test tube? (i) The temperature of the solution increases (ii) The temperature of the solution decreases (iii) The temperature of the solution remains the same (iv) Salt formation takes place (a) (i) only (b) (i) and (iii) (c) (ii) and (iii) (d) (i) and (iv)	1
6	What is the pH of a neutral solution? (a) 7 (b) 1 (c) 14 (d) 0	1

7	What happens when lead nitrate reacts with potassium iodide? (a) They will not react (b) A large amount of hydrogen will be released (c) Yellow ppt of lead iodide and potassium nitrate will be produced (d) Evolution of gas will occur	1
8	Choose the function of the pancreatic juice from the following. (a) trypsin digests proteins and lipase carbohydrates (b) trypsin digests emulsified fats and lipase proteins (c) trypsin and lipase digest fats (d) trypsin digests proteins and lipase emulsified fats.	1
9	Upon receiving a signal, the dendrite tip of a nerve cell sets off a chemical reaction that, (a)Creates an electrical impulse in the dendrite. (b) Creates an electrical impulse in the next neuron. (c)Releases some chemicals in the cell body of the neuron. (d) Creates a stimulus.	1
10	In the excretory system of human beings, some substances in the initial filtrate such as glucose, amino acids, salts and water are selectively reabsorbed in, a) Urethra (b) nephron (c) ureter (d) urinary bladder	1
11	Which is the correct sequence of air passage during inhalation? (a) Nostrils →larynx →trachea →lungs (b) Nasal passage →trachea →pharynx →larynx →alveoli (c) larynx →nostrils →pharynx →lungs (d) Nostrils →pharynx →larynx →trachea →alveoli	1
12	Which of the following statement (s) is (are) true about the heart? (i) The left atrium receives oxygenated blood from different parts of the body while the right atrium receives deoxygenated blood from lungs (ii) Left ventricle pumps oxygenated blood to different body parts while right ventricle pumps deoxygenated blood to lungs (iii) Left atrium transfers oxygenated blood to the right ventricle which sends it to different body parts (iv) The right atrium receives deoxygenated blood from different parts of the body while the left ventricle pumps oxygenated blood to different parts of the body (a) (i)(b) (ii)(c) (ii) and (iv)(d) (i) and (iii)	1
13	Magnification produced by a rear-view mirror fitted in vehicles: (a) is less than one (b) is more than one (c) is equal to one (d) can be more than or less than one, depending upon the position of the object in front of it	1
14	You are given three media A, B and C of refractive index 1.33, 1.65 and 1.46. The medium in which the light will travel fastest is (a) A (b) B (c) C (d) equal in all three media	1

15	Human eye forms the image of an object formed on (a) Iris (b) Pupil (c) Retina (d) Cornea	1
16	Which of the following statements is true about the brain? (i) The main thinking part of the brain is the hindbrain (ii) Centres of hearing, smell, memory, sight etc., are located in the forebrain. (iii) Involuntary actions like salivation, vomiting, and blood pressure are controlled by the medulla in the hindbrain (iv) Cerebellum does not control the posture and balance of the body (a) (i) and (ii) (b) (i), (ii) and (iii) (c) (ii) and (iii) (d) (iii) and (iv).	1
	INSTRUCTIONS FOR QUESTIONS 17 -20 **Option A,** if both Assertion and Reason are true and Reason is the correct explanation of Assertion. **Option B,** if Both Assertion and Reason are true but Reason is not the correct explanation of Assertion. **Option C**, if only Assertion is true but Reason is false. **Option D,** if Assertion is false but Reason is true.	
17.	Assertion: A receptor is specialised group of cells in a sense organ that perceive a particular type of stimulus. Reason: Different sense organs have different receptors for detecting stimuli.	1
18	Assertion: White light is dispersed into its seven-colour components by a prism. Reason : Different colours of light bend through different angles with respect to the incident ray, as they pass through a prism	1
19	Assertion: Diffusion does not meet high energy requirements of multi-cellular organisms Reason: Diffusion is a fast process but occurs at the surface of the body.	1
20	Assertion (A): All decomposition reactions are generally endothermic reactions. Reason (R): All decomposition reactions generally occur with the adsorption of heat or light energy.	1
	SECTION B (VERY SHORT ANSWER TYPE QUESTION)	
21	What is meant by the power of a lens? What is its S.I. unit? Name the type of lens whose power is positive	2
22	Explain Rainbow Formation. **OR** i) What is meant by the power of accommodation of the eye? ii) What is the role of ciliary muscles in eye?	2
23	A student is unable to see clearly the words written on the black board placed at a distance of approximately 3 m from him. Name the defect of vision the boy is suffering from. State the possible causes of this defect and explain the method of correcting it.	2

24	Label the parts (a), (b), (c) and (d) and show the direction of the flow of electrical signals in figure  Fig. 7.2	2
25	Give reasons: i) Ventricles have thicker muscular walls than atria. ii) Veins have valves whereas arteries do not. **OR** Explain double circulation in human beings.	2
26	Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write chemical equation involved.	2
	SECTION C (SHORT ANSWER TYPE QUESTIONS)	
27	i) Show the formation of MgO by the transfer of electrons. ii) Differentiate between calcination and roasting.	3
28	A white powder is added while baking cakes to make it soft and spongy. Name its main ingredients. Explain the function of each ingredient. Write the chemical reaction taking place when the powder is heated during baking.	3
29	Give advantages and disadvantages of transpiration. (three points).	3
30	What are the major parts of the brain? Mention the functions of different parts.	3
31	i)What is translocation? Why is it essential for plants? ii)Where do the substances in plants reach as a result to translocation?	3
32	A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4 cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror? Also calculate the size of the image formed.	3
33	Name the phenomenon responsible for the following observations i) Danger signals are red. ii) "The time difference between the actual sunset and the apparent sunset is about 2 minutes" iii)A pencil dipped in water appears to be bent.	3

	SECTION D (LONG ANSWER TYPE QUESTION)	
34	i)Give reason for the following: (a) Ionic compounds have higher melting point and higher boiling point. (b) Sodium is kept immersed in kerosene. ii) Name the anode, cathode, electrolyte and impurity obtained during refining of copper metal. iii) Write chemical equation for the reaction taking place when zinc sulphide (ore) is heated in air. **OR** Give reason: i) Aluminium is a reactive metal but is still used for packing food articles. ii) Hydrogen gas is not evolved when most of the metals react with nitric acid. iii) Zinc oxide is considered as an amphoteric oxide. iv) Metals conduct electricity. v) The reaction of iron (III) oxide with aluminium is used to join cracked iron parts of machines.	5
35	a) The refractive indices of glass and water with respect to air are 3/2 and 4/3 respectively. If speed of light in glass is 2×10^8 m/s, find the speed of light in water. b) Draw ray diagram to show the path of the refracted ray in each of the following cases. A ray of light incident on a concave lens (i) is parallel to its principal axis, (ii) is passing through its optical centre and (iii) is directed towards its principal focus OR (a) Define focal length of a spherical lens. (b) A divergent lens has a focal length of 30 cm. At what distance should an object of height 5 cm from the optical centre of the lens be placed so that its image is formed 15 cm away from the lens? (c) Draw a ray diagram to show the formation of image in the above situation.	5
36	a) Define excretion. Name the basic filtration unit present in kidney. b)Draw a well labelled diagram of human excretory system. OR a) Whatare reflex actions? Give two examples. b) Explain a reflex arc with the help of flow chart.	5
	SECTION E (CASE BASED QUESTIONS)	
37	The interplay of light with objects around us gives rise to several spectacular phenomena in nature. The blue colour of the sky, colour of water in deep sea, the reddening of the sun at sunrise and the sunset are some of the wonderful phenomena we are familiar with. The path of a beam of light passing through a true solution is not visible. However, its path becomes visible through a colloidal solution where the size of the particles is relatively larger.	1+1+2=4

	i) Name the component of white light that deviates the least while passing through a glass prism. ii) Name the phenomena of splitting of white light on passing through prism. iii) Why sky appears to be blue in colour most of the time?	
38	If you carefully observe a cross-section of a leaf under the microscope shown in Figure given below, you will notice that some cells contain green dots. These green dots are cell organelles called chloroplasts which contain chlorophyll. (a) What is the role of these dots that contain chlorophyll. (b) What is the main difference you see between upper and lower epidermis? (c) What is the role of air spaces? (d) Name the layer of cells that contain chloroplasts.  	
39	We all know that we need energy to stay alive. We get this energy from the food we eat. During digestion, food is broken down into simpler substances. For example, rice, potatoes and bread contain carbohydrates. These carbohydrates are broken down to form glucose. This glucose combines with oxygen in the cells of our body and provides energy. The special name of this reaction is respiration. i) Which type of reaction is respiration? ii) Why chemical equations should be balanced? iii) Give an example of combination reaction (reaction).	1+1+2=4