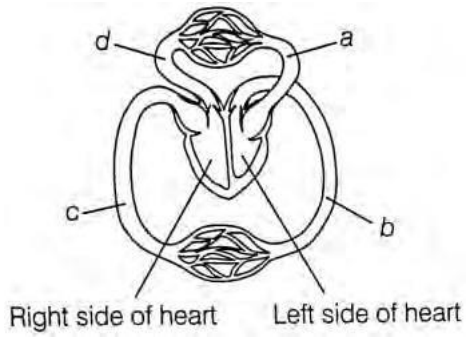
ATOMIC ENERGY CENTRAL SCHOOL -5, MUMBAI

Class X Science (086)

Session: 2023-2024

Periodic Test-1

Time: 1hr 30 min. Maximum Marks: **40**

SECTION A		
No.	**Questions**	**Marks**
1	Which of the following structures is involved in gaseous exchange in woody stem of a plant? (a) Stomata (b) Lenticel (c) Hydathode (d) Epidermis	1
2	Only two of the following Statements accurately describe what happens in the mouth. 1. Amylase breaks down large starch molecules into smaller maltose molecules. 2. Chewing increases the surface area of food for digestion. 3. Saliva emulsifies fats into smaller droplets. 4. Teeth breakup large insoluble molecules into smaller soluble molecules Which statements are correct? (a) 1 and 2 (b) 2 and 3 (c) 3 and 4 (d) 1 and 4	1
3	The diagram represents a part of human circulatory system. Where is the blood pressure highest?  (a) a (b) b (c) c (d) d	1
4	The following reaction is an example of a $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$ (i) displacement reaction (ii) combination reaction (iii) redox reaction (iv) neutralisation reaction (a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (iii) (d) (iii) and (iv)	1

5	Which of the following are exothermic processes? (i) Reaction of water with quick lime (ii) Dilution of an acid (iii) Evaporation of water (iv) Sublimation of camphor (crystals) (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iv) (d) (iii) and (iv)	1
6	Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is (a) 1:1 (b) 2:1 (c) 4:1 (d) 1:2	1
	Directions: In the following questions from 7 to 9, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as: (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 but 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:** In the daytime, CO2 generated during respiration is used up for photosynthesis. **Reason:** There is no CO2 release during day.	1
8	**Assertion:** Brown fumes are produced when lead nitrate is heated. **Reason:** Nitrogen dioxide gas is produced as a by-product due to the decomposition of lead nitrate.	1
9	**Assertion**: We prefer a convex mirror as a rear-view mirror in vehicles. **Reason**: Because they always give an erect, though diminished image.	1
	SECTION-B	
10	A student took a solution of copper sulphate in a beaker and put a clean iron nail into it and left it for about an hour. (a) What changes do you expect? (b) Write a word equation for the chemical change, if any.	2
11	Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in vacuum is 3×10^8 m s^{-1} .	2
	SECTION-C	
12	Draw a neat diagram of nephron. Name and label the following parts: (a) Blood vessel that brings in nitrogenous wastes. (b) Part where the filtration occurs. (c) Part where reabsorption of water takes place. (d) Part which collects urine.	1+2=3

13	An object, 4.0 cm in size, is placed at 25.0 cm in front of a concave mirror of focal length 15.0 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? Find the nature and the size of the image.	3
	SECTION-D	
14	(a) Human beings exhibit "double circulation" during which blood is passed through the lungs and heart. 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. (b) We often hear people complain about 'acidity' in the stomach. (i) Overproduction of what substance is most likely the reason for the complaint? (ii) Why is the production of this substance necessary? (c)Why do aquatic animals have higher breathing rate than terrestrial animals?	2+2+1=5
15	I. What is a redox reaction? Identify the substances oxidized and the substances reduced in the following reactions. (a) $2PbO+C \rightarrow 2Pb+CO_2$ (b) $MnO_2+4HCl \rightarrow MnCl_2+2H_2O+Cl_2$ II. A student has mixed the solutions of lead nitrate and potassium iodide. (a) What was the colour of the precipitate formed? Can you name the compound? (b) Write the balanced chemical equation for this reaction.	3+2=5
16	Draw a ray diagram to show the image formation in case of a convex lens when the object is placed at the centre of curvature. A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image. Also find its magnification. What is the the SI unit of power of a lens?	5
	SECTION-E [CASE-BASED]	
17	**Not all plants carry out photosynthesis by the same mechanism. In most plants, photosynthesis depends directly on the gaseous carbon dioxide that diffuses into the leaf through the stomata.** **However, some plants - such as pineapple - have the ability to store carbon dioxide in the vacuoles of the leaf cells as part of a complex carbon compound. This complex compound is transported to the chloroplasts and releases carbon dioxide when required, for photosynthesis to occur.** **This special photosynthesis mechanism is believed to have evolved as an adaptation to conserve water for survival in dry conditions.** (a) Which process in the plants does this photosynthesis mechanism minimise to help the plants survive in dry condition?	½+1+½=2

	(b) How is the ability to store carbon dioxide as a complex compound likely to help minimise the process referred to in (a)? (c) When are such plants likely to take in carbon dioxide from the environment?	
18	A solution of slaked lime produced by the reaction is used for white washing walls. Calcium hydroxide reacts slowly with the carbon dioxide in air to form a thin layer of calcium carbonate on the walls. Calcium carbonate is formed after two to three days of white washing and gives a shiny finish to the walls. It is interesting to note that the chemical formula for marble is also $CaCO_3$. (a) Give the reaction for the formation of calcium carbonate with physical states. (b) Write the formulas of slaked lime, quick lime.	1+1
19	The curved surface of a spoon can be considered as a spherical mirror. A highly smooth polished surface is called mirror. The mirror whose reflecting surface is curved inwards or outwards is called a spherical mirror. Inner part works as a concave mirror and the outer bulging part acts as a convex mirror. The center of the reflecting surface of a mirror is called pole and the radius of the sphere of which the mirror is formed is called radius of curvature. (i) When a concave mirror is held towards the sun and its sharp image is formed on a piece of carbon paper for some time, a hole is burnt in the carbon paper. What is the name given to the distance between the mirror and carbon paper? (a) Radius of curvature (b) Focal length (c) Principal focus (d) Principal axis (ii) The distance between pole and focal point of a spherical mirror is equal to the distance between (a) pole and center of curvature (b) focus point and center of curvature (c) pole and object (d) object and image	2

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