# BUDHA DAL PUBLIC SCHOOL PATIALA First Term Examination (6 September 2024) CLASS - X PAPER- SCIENCE (SET-B)

# Time:3 hr.

Q2.

# **General Instructions:**

- i) This question paper consists of 39 questions in 5 sections.
- 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.
- iii) Section A consists of 20 objective type questions carrying 1 mark each.
- iv) Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v) Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
   vi) Section D consists of 3 Long Auswer type questions carrying 05.
- vi) Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
   vii) Section E consists of 3 source-based/case based units of a source-based/case based/case ba
- vii) Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

## Section - A

- Q1. The colour of solution observed after 30 minutes of placing zinc metal to copper sulphate (1) solution is
  - a) blue b) colourless c) dirty green d) reddish brown
  - Select a pair of natural Indicator from the following:
    - a) Litmus and Methyl orange b) Turmeric and Litmus
    - c) phenolphthalein and Methyl orange d) Methyl orange and Turmeric
- Q3. To balance the following chemical equation the value of coefficients x, y and z must be (1) respectively.

 $x Zn (NO_3)_2 \xrightarrow{\Delta} yZnO + ZNO_2 + O_2$ 

- a) 4, 2, 2 b) 4, 4, 2 c) 2, 2, 4 d) 2, 4, 2
- Q4. The salt present in tooth enamel is
  - a) Calcium phosphate b) Magnesium phosphate
  - c) Sodium phosphate d) Aluminium phosphate
- Q5. Select Endothermic reaction from the following:
  - a) Decomposition of vegetable matter into compost
  - b) Decomposition of calcium carbonate to form quick line and carbon dioxide
  - c) Burning of candle
  - d) Process of respiration
- Q6. Which of the following salts does not contain water of crystallization. (1)a) Blue vitrol b) Baking soda c) Washing soda d) Gypsum
- Q7. Translate the following equation into chemical equation and then balance it. (1) Nitrogen gas is treated with hydrogen gas to form ammonia gas

M.M. 80

(1)

(1)

(1)

R-1

In the given transverse section of the leaf identify the layer of cells where maximum photosynthesis occurs. (1) Ι Π III IV (a) I, II (b) II, III (c) III, IV (d) I, IV Q9. Which of the following plays the important role of creating a suction force which pulls water upwards from roots of a tree to its leaves? (1) b) Respiration c) Transpiration d) Photosynthesis a) Gravitation Posture and balance of the body is controlled by Q10. a) Cerebellum b) cerebrum c) Medulla d) Pons (1)O11. Which of the following endocrine glands in human beings is unpaired? a) Adrenal b) Testes c) Pituitary d) Ovary (1)The growth of tendril in pea plants is due to Q12. a) Effect of gravity (1) b) Rapid cell divisions in tendril cells that are away from the support. Rapid cell divisions in tendril cells that are in contact with the support. c) d) Hydrotropism Consider these indices of refraction : glass : 1.52, air: 1.0003; water: 1.333. Based on the Q13. refractive indices of three materials, arrange the speed of light through them in decreasing (1) 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 in light in glass. d) The speed of light in glass> the speed of light in air> the speed of light in water. Study the given ray diagrams and select the correct statement from the following: Q14. a) Device X is a concave mirror and device Y is a convex lens, whose focal lengths are 20 (1) cm and 25 cm respectively. b) Device X is a convex lens and device Y is a concave mirror, whose focal lengths are 10 cm and 25 cm respectively. c) Device X is a concave lens and device Y is a convex mirror, whose focal lengths are 20 cm and 25 cm respectively. d) Device A is a convex lens and device Y is a concave mirror, whose focal lengths are 20 cm and 25 cm respectively.



Concave lens

-Convex lens

B-3

Draw a ray diagram to show the nature and position of an image formed by a convex lens (2) 025. of power +0.1 D, when an object is placed at a distance of 20 cm from its optical centre.

OR

Complete the following ray diagram:



How does our body responds when adrendire is secreted into blood? Q26.

Why is the use of iodised salt advisable? Name the disease caused due to deficiency of iodine in our diet.

OR

### Section - C

- A shiny brown coloured element 'X' on heating in air becomes black in colour. Name (3)Q27. element 'X' and black substance formed with the help of equation.
- On heating 'X' at 373K, it loses water molecules and becomes 'Y'. 'Y' is a substance which (3)Q28. doctors use for supporting fractured bones in right position.
  - a) Identify 'X' and 'Y'
  - b) How can 'X' be reobtained from 'Y'?

#### OR

Salt a commonly used in bakery products on heating gets converted into another salt B which itself is used for removal of hardness of water and a and C is evolved. The gas C when passed through lime water turns it milky. Identify the name and formula of A, B, C

- a) How brain is protected? Q29.
  - b) Draw a flow chart of reflex arc when a bright light enters our eyes.
- List three differences between arteries and veins by considering the following parameters. Q30. (3) a) Valves b) wall c) Lumen
- Rays from Sun coverage at a point 15 cm in front of a concave mirror. Where should an (3) Q31. object be placed so that size of its image is equal to the size of the object?
- Q32.

Without actually drawing the ray diagram, statethe following:

- a) Type of lens (Converging/ diverging"
- b) Name an optical instrument where such an image is obtained
- c) List two characteristics of the image formed if this lens is replaced by a concave mirror of focal length 'f' and an object is placed at a distance 'f/2' in front of the mirror.
- a) Water has refractive index 1.33 and alcohol has refractive index 1.36. Which of the (3) two medium is optically Denser? Give reason for your answer.
- b) Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.

Q33.

(2)

(3)

(3)

### Section - D

- a) Four samples A, B, C and D change the colour of pH paper to green, Reddish pink, (5) Blue and Orange. This pH was recorded as 7, 2, 10.5 and 6 respectively. Arrange the four samples in the decreasing order of this pH. Identify most acidic and alkaline solution from above samples.
- b) A student is diluting a concentrate acid. What precaution he should take while diluting acid and why?

#### OR

a) The pH of 3 solutions is given in the table. Answer the questions:

Solution	pН
Р	1
Q	7
R	14

1) Which of these solutions could possibly react to produce hydrogen gas?

2) Which of these solutions could be raw material for industrial manufactures of chlorine?

b) Why does dry HCl gas not change colour of dry litmus paper.

#### 1) Give reasons : Q35.

- a) Circulation of blood in aquatic vertebrates differs from that in terrestrial (5)
- b) Ventricles have thicker muscular walls than atria.
- c) Veins have valves whereas arteries do not.

2. Why do multicellular organisms need another means of communication between cells besides nervous coordination?

## OR

A figure given below shows a diagram of nephron. Answer the following questions related



- a) Label the following parts (i), (ii), (iii) & (iv)
- b) Write function of (i)

Q36.

- c) What is selective reabsorption and how does it take place.
- a) What is visible spectrum?
- b) Why is red used as the stopping light at traffic signals?
- c) Two triangular glass prisms are kept together connected through their rectangular side. A light beam is passed through one side of the combination. Will there be any

## OR

- a) What happens when a narrow beam of (i) monochromatic light and (ii) white light passes through a glass slab and a glass prism?
- b) What is scattering of light?
- c) Why does the clear sky appear blue?

*Q*34.

(5)



Study the experimental set-up shown in the diagram and write chemical equation for the chemical reaction involved. Name and define the type of reaction. List two other metals which can be used in place of iron to show the same type of reaction with copper sulphate solution.

#### Read the paragraph and answer the following questions: Q38.

Bacteria that live in our mouths cause dental caries (tooth decay). Caries has been a problem since the 1700s when sugar became available from the expanding sugarcane industry.

(4)

B-6

Today, we know a lot about caries. For example:

- Bacteria that cause caries feed on sugar.
- The sugar is transformed to acid.
- Acid damages the surface of teeth.
- Brushing teeth helps to prevent caries.
- (a) What is the role of bacteria in dental caries?
- (b) The given graph shows the consumption of sugar and the amount of caries in different countries. Each country is represented by a dot in the graph.



- Which of the following statements is supported by the data given in the graph? (i) In some countries, people brush their teeth more frequently than in other countries.
- (ii) The more sugar people eat, the more likely they are to get caries.
- (iii) In recent years, the rate of caries has increased in many countries.
- (iv) In recent years, the consumption of sugar has increased in many countries.
- (c) How can tooth decay be prevented?
- (d) What role does mouth play in digestion of food?

Study the following table for a convex lens for different ions of object and answer the following questions:

Position of	Position of	Relative size of image
At infinity	At focus F2	Highly diminished point sized
Beyond 2F1	Between $F_2$ and $2F_2$	Diminished
	At 2F2	Same size
Between Fi and	Beyond 2F2	Enlarged
2F1 At focus F1	At infinity	Infinitely large or highly enlarged
Between focus $F_1$ and optical	On the same side of the lens as the object	Enlarged

What is the nature of t placed at infinity ? (i)

(iii) What is position of image, when object is place at focus (/i)?
(iv) What is the focal length of a lens for an object placed 50 cm from the lens producing virtual image at a distance of 10 cm in front of the lens. (')

(b) -12.5 cm (a) 12 cm (c) 5 cm (d) - 5 cm (ir). What is the size of the image if object is

placed Beyond of Fi

(4)

(1)

R-7

<sup>(</sup>ii) Identify the nature of the image for which the object is between focus and optical centre. (1) (1)