

# CBSE EXAMINATION PAPER-2024

## SCIENCE

(Solved)

Time allowed : 3 hours

Maximum Marks : 42

### General Instructions :

Read the following instructions carefully and follow them :

- i. This question paper contains **22 questions**. All questions are **compulsory**.
- ii. This question paper is divided into **5 sections**.
- iii. **Section A** – questions number **1 to 7** are multiple choice questions Each question carries **1 marks**.
- iv. **Section B** – questions number **8 to 15** are very short answer Each question carries **2 marks**.
- v. **Section C** – questions number **16 to 18** are short answer Each question carries **3 marks**.
- vi. **Section D** – questions number **19 to 20** are case based questions
- vii. **Section E** – questions number **21 to 22** are long answer Each question carries **5 marks**.
- viii. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.
- ix. Use of calculator is NOT allowed.

## Section A

### Question 1.

Select a pair of natural indicator from the following:

[1 Marks]

- (A) Litmus and methyl orange
- (B) Methyl orange and Turmeric
- (C) Phenolphthalein and methyl orange
- (D) Turmeric and Litmus

**Question 2.**

Consider the following Chemical equation:  $a\text{Al}_2\text{O}_3 + b\text{HCl} \rightarrow c\text{AlCl}_3 + d\text{H}_2\text{O}$  In order to balance this chemical equation, the values of a, b, c and d must be

[1 Marks]

- (A) 1, 6, 2 and 3
- (B) 1, 6, 3 and 2
- (C) 2, 6, 2 and 3
- (D) 2, 6, 3 and 2

**Question 3.** Select from the following a plant hormone which promotes cell division.

[1 Marks]

- (A) Gibberellins
- (B) Auxins
- (C) Abscissic Acid
- (D) Cytokinins

**Question 4.**

Part(s) of a flower which attracts insects for pollination is (are)

[1 Marks]

- (A) petals and Sepals
- (B) anther and Stigma
- (C) petals only
- (D) sepals only

**Question 5.** In an experiment to study independent inheritance of two separate traits: shape and colour of seeds, the ratio of the different combinations in F<sub>2</sub> progeny would be [1 Marks]

(A) 1:3

(B) 9:3:3:1

(C) 1:2:1

(D) 9:1:1:3

**Question 6.**

The Phenomena of light involved in the formation of a rainbow in the sky are

[1 Marks]

(A) Refraction, dispersion and reflection

(B) Dispersion, refraction and internal reflection

(C) Dispersion, scattering and reflection

(D) Refraction, dispersion and total internal reflection

**Question 7.**

A food chain will be more advantageous in terms of energy if it has

[1 Marks]

(A) 2 trophic levels

(B) 5 trophic levels

(C) 4 trophic levels

(D) 3 trophic levels

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## Section B

**Question 8.** When magnesium ribbon is burnt in air, an ash of white colour is produced. Write the chemical equation for the reaction giving the chemical name of the ash produced. State the type of chemical reaction giving justification for your answer.

[2 Marks]

**Question 9.** Where are auxins synthesized? How do they promote phototropism?

[2 Marks]

**Question 10.** List any two pairs of visible contrasting characters of garden pea plants used by Mendel for his experiments stating the dominant and recessive characters in each pair.

[2 Marks]

**Question 11.** In human beings, the probability of getting a male or a female child is 50%. Explain with the help of a flow diagram only.

[2 Marks]

**Question 12.** When do we say that a particular person is suffering from hypermetropia? List two causes of this defect. Name the type of lens used to correct this defect.

[2 Marks]

**Question 13.**

Draw a labelled diagram to show the pattern of magnetic field lines produced due to a current carrying straight conductor. Mark on it the direction of current in the conductor and the direction of magnetic field lines.

[2 Marks]

**Question 14.**

Name the device used to magnetise a piece of magnetic material. Draw a labelled diagram to show the arrangement used for the magnetisation of a cylinder made of soft iron.

[2 Marks]

**Question 15.** What are decomposers? List two consequences of their absence in an ecosystem.

[2 Marks]

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## Section C

**Question 16.** We water the soil but it reaches the topmost leaves of the plants. Explain in brief the process involved.

[3 Marks]

**Question 17.** Name and explain the phenomenon of light due to which the path of a beam of light becomes visible when it enters a smoke-filled room through a small hole. Also,

state the dependence of the colour of the light we receive on the size of the particle of the medium through which the beam of light passes.

[3 Marks]

**Question 18.** Explain in brief the function of an electric fuse in a domestic circuit. An electric heater of current rating 3 kW; 220 V is to be operated in an electric circuit of rating 5 A. What is likely to happen when the heater is switched ON? Justify your answer with necessary calculations.

[3 Marks]

## Section D

**Question 19.** Human digestive system is a tube running from mouth to anus. Its main function is to breakdown complex molecules present in the food which cannot be absorbed as such into smaller molecules. These molecules are absorbed across the walls of the tube and the absorbed food reaches each and every cell of the body where it is utilised for obtaining energy.

(1) Name the glands present in the buccal cavity and write the components of food on which the secretion of these glands act upon.

[1 Marks]

(2)

Two organs have a sphincter muscle at their exit. Name them.

[-1 Marks]

(3)

"Bile juice does not contain any enzyme, yet it has important roles in digestion." Justify the statement.

[2 Marks]

(4)

What will happen if:

(i) mucus is not secreted by the gastric glands.

(ii) Villi are absent in the small intestine.

[2 Marks]

**Question 20.** In a domestic circuit five LED bulbs are arranged as shown. The source voltage is 220 V and the power rating of each bulb is marked in the circuit diagram. Based on the following circuit diagram, answer the following questions:

(1) (a) State what happens when (i) key  $K_1$  is closed. (ii) key  $K_2$  is closed.

[1 Marks]

(2)

Find the current drawn by the bulb B when it glows.

(3)

What would happen to the glow of all the bulbs in the circuit when keys  $K_1$  and  $K_2$  both are closed and the bulb C suddenly get fused? Give reason to justify your answer.

[2 Marks]

(4)

Calculate

(i) the resistance of bulb B, and

(ii) total resistance of the combination of four bulbs B, C, D and E.

[2 Marks]

## Section E

### Question 21.

Name and state in brief the process which is used to prepare sodium hydroxide from sodium chloride. In this process along with the main product two gases 'X' and 'Y' are also given off at the two electrodes. Name 'X' and 'Y' specifying the name of their respective electrode at which each gas is obtained. One of these gases when reacts with dry calcium hydroxide produces a compound 'Z' which is widely used in water treatment plants and textile industries. Name 'Z' and write chemical equation for the reaction involved in its formation.

[5 Marks]

### Question 22.

Draw a ray diagram to show the path of the reflected ray in each of the following cases:

A ray of light incident on a convex mirror

(1) parallel to its principal axis, and

(2) is directed towards its principal focus

[5 Marks]

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