CBSE EXAMINATION PAPER-2024

SCIENCE

(Solved)

Time allowed : 3 hours | Maximum Marks : 58

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **33 questions.** All questions are **compulsory.**

ii. This question paper is divided into **5 sections.**

iii. **Section A** – questions number **1 to 16** are multiple choice questions Each question carries **1 marks.**

iv. **Section B** – questions number **17 to 23** are very short answer Each question carries **2 marks.**

v. **Section C** – questions number **24 to 29** are short answer Each question carries **3 marks.**

vi. **Section D** – questions number **30 to 31** are case based questions

vii. **Section E** – questions number **32 to 33** 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.

$Zn + 2CH_3COOH \rightarrow (CH_3COO)_2 Zn + H_2$. The above reaction is a:

[1 Marks]

(A) Double displacement reaction

(B) Displacement reaction

(C) Combination reaction

(D) Decomposition reaction

Question 2.

An aqueous solution of a salt turns blue litmus to red. The salt could be the one obtained by the reaction of:

[1 Marks]

(A) CH_3COOH and $NaOH$

(B) H_2SO_4 and KOH

(C) HCl and NH_4OH

(D) HNO_3 and $NaOH$

Question 3. Four solutions, namely glucose, alcohol, hydrochloric acid and sulphuric acid filled in four separate beakers are connected one by one in an electric circuit with a bulb. The solutions in which the bulb will glow when current is passed are:

[1 Marks]

(A) Glucose and alcohol

(B) Alcohol and hydrochloric acid

(C) Glucose and sulphuric acid

(D) Hydrochloric acid and sulphuric acid

Question 4.

The metals which are found in both free state as well as combined state are:

[1 Marks]

(A) Gold and silver

(B) Gold and platinum

(C) Copper and silver

(D) Platinum and silver

Question 5. In human beings, when the process of digestion is completed, the (i) proteins, (ii) carbohydrates, and (iii) fats are respectively finally converted into:

[1 Marks]

(A) (i) Amino acids, (ii) glucose and (iii) fatty acids

(B) (i) Amino acids, (ii) glucose, (iii) fatty acids and glycerol

(C) (i) Glucose, (ii) fatty acids and glycerol, (iii) amino acids

(D) (i) Sugars, (ii) amino acids, (iii) fatty acids and glycerol

Question 6. A plant growth inhibitor hormone which causes wilting of leaves is called:

[1 Marks]

(A) Abscisic acid

(B) Cytokinin

(C) Gibberellin

(D) Auxin

Question 7. The plants that can be raised by the method of vegetative propagation are:

[1 Marks]

(A) Sugarcane, roses, grapes

(B) Banana, orange, mustard

(C) Sugarcane, mustard, potato

(D) Papaya, mustard, potato

Question 8. The part of seed which is a source of food during germination of seed is:

[1 Marks]

(A) Cotyledon

(B) Radicle

(C) Plumule

(D) Embryo

Question 9. A zygote is formed by the fusion of a male gamete and a female gamete. The number of chromosomes in the zygote of a human is:

[1 Marks]

(A) 23

(B) 44

(C) 92

(D) 46

Question 10.

Absolute refractive index of glass and water is 3/2 and 4/3 respectively. If the speed of light in glass is 2×10^8 m/s, the speed of light in water is:

[1 Marks]

(A) $4/9 \times 10^8$ m/s

(B) $9/16 \times 10^8$ m/s

(C) $3/7 \times 10^8$ m/s

(D) $2/5 \times 10^8$ m/s

Question 11. When a beam of white light passes through a region having very fine dust particles, the colour of light mainly scattered in that region is:

[1 Marks]

(A) Orange

(B) Yellow

(C) Blue

(D) Red

Question 12.

Consider the following combinations of resistors: The combinations having equivalent resistance 1 is/are:

[1 Marks]

(A) I and IV

(B) Only IV

(C) I, II and III

(D) I and II

Question 13.

An electric iron of resistance 20 Ω draws a current of 5 A. The heat developed in the iron in 30 seconds is:

[1 Marks]

(A) 15000 J

(B) 1500 J

(C) 3000 J

(D) 6000 J

Question 14.

A rectangular loop ABCD carrying a current I is situated near a straight conductor XY, such that the conductor is parallel to the side AB of the loop and is in the plane of the loop. If a steady current I is established in the conductor, the conductor XY will:

[1 Marks]

(A) rotate about its axis.

(B) remain stationary.

(C) move away from the side AB of the loop.

(D) move towards the side AB of the loop.

Question 15. Some wastes are given below: (i) Garden waste (ii) Ballpoint pen refills (iii) Empty medicine bottles made of glass (iv) Peels of fruits and vegetables (v) Old cotton shirt. The non-biodegradable wastes among these are:

[1 Marks]

(A) (ii) and (iii)

(B) (i) and (ii)

(C) (i), (iv) and (v)

(D) (i), (iii) and (iv)

Question 16.

Assertion (A): The extraction of metals from their sulphide ores cannot take place without roasting of the ore. Reason (R): Roasting converts sulphide ores directly into metals.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(B) Assertion (A) is false, but Reason (R) is true.

(C) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Section B

Question 17. Distinguish between a saturated and an unsaturated hydrocarbon by flame test. List the products of the combustion reaction of a saturated hydrocarbon.

[2 Marks]

Question 18. We need to water the soil in plants regularly, but it ultimately reaches the leaves of the plant. Explain how this takes place.

[2 Marks]

Question 19. The survival of a species is promoted through the creation of variations. Illustrate with an example.

[2 Marks]

Question 20. A person suffering from presbyopia needs bifocal lens. If he needs two lenses of power 4·0 dioptre and + 2·0 dioptre, which one of these two lenses is for the correction of distant vision and what is its focal length?

[2 Marks]

Question 21. Two wires A and B of the same material, having the same lengths and diameters 0.2 mm and 0.3 mm respectively, are connected one by one in a circuit. Which one of these two wires will offer more resistance to the flow of current in the circuit? Justify your answer.

[2 Marks]

Question 22.

Some metals react with acids to produce salt and hydrogen gas. Illustrate it with an example. How will you test the presence of this gas ?

[2 Marks]

Question 23.

Name the type of nutrition exhibited by Amoeba. Explain how food is taken in and digested by this organism.

[2 Marks]

Section C

Question 24.

Write the common name and the chemical name of the compound $CaSO_4 \cdot 1/2\ H_2O$. Write the method of its preparation. Give chemical equation for the reaction, when water reacts with $CaSO_4 \cdot 1/2\ H_2O$.

[3 Marks]

Question 25.

Why is the conversion of ethanol to ethanoic acid an oxidation reaction ? Name the oxidising agent used in this conversion. Write chemical equation for this oxidation reaction. How is this reaction different from the reaction in which ethanol burns in the presence of oxygen ?

[3 Marks]

Question 26. Explain with the help of a labelled diagram, the process of reproduction in Hydra by budding. Name the cells used for reproduction in this process.

[3 Marks]

Question 27.

List two differences between dominant traits and recessive traits. What percentage of pea plants in the F_2 generation were with yellow seeds in yellow (YY) and green coloured (yy) seeds?

[3 Marks]

Question 28. Define the term power of accommodation of human eye. What happens to the image distance in the eye when we increase the distance of an object from the eye? Name and explain the role of the part of human eye responsible for it in this case.

[3 Marks]

Question 29.

List two roles of each of the following in human reproductive system : (i) Seminal vesicles and prostate gland (ii) Oviduct (iii) Testis

[3 Marks]

Section D

Question 30.

Three metal samples of magnesium, aluminium and iron were taken and rubbed with sand paper. These samples were then put separately in test tubes containing dilute hydrochloric acid. Thermometers were also suspended in each test tube so that their bulbs dipped in the acid. The rate of formation of bubbles was observed. The above activity was repeated with dilute nitric acid and the observations were recorded. Answer the following questions:

(1) When activity was done with dilute hydrochloric acid, then in which one of the test tubes was the rate of formation of bubbles the fastest and the thermometer showed the highest temperature?

[1 Marks]

(2) Which metal did not react with dilute hydrochloric acid? Give reason.

[1 Marks]

(3)

Why is hydrogen gas not evolved when a metal reacts with dilute nitric acid? Name the ultimate products formed in the reaction

[2 Marks]

(4)

Name the type of reaction on the basis of which reactivity of metals is decided. You have two metals X and Y. How would you decide which is more reactive than the other?

[2 Marks]

Question 31. Study the following circuit: On the basis of this circuit, answer the following questions:

(1) Find the value of total resistance between the points A and B.

[1 Marks]

(2)

Find the resistance between the points B and C.

[1 Marks]

(3)

Calculate the current drawn from the battery, when the key is closed.

[2 Marks]

(4)

In the above circuit, the 16 Ω resistor or the parallel combination of two resistors of 8Ω , which one of the two will have more potential difference across its two ends ? Justify your answer.

[2 Marks]

Section E

Question 32. What is a chemical reaction? Describe one activity each to show that a chemical change has occurred in which (i) change of colour, and (ii) change in temperature has taken place.

[5 Marks]

Question 33.

The variation of image distance (v) with object distance (u) for a convex lens is given in the following observation table. Analyse it and answer the questions that follow :

(i) Without calculation, find the focal length of the convex lens. Justify your answer.

(ii) Which observation is not correct ? Why ? Draw ray diagram to find the position of the image formed for this position of the object.

(iii) Find the approximate value of magnification for u = 30 cm.

[5 Marks]
