CBSE EXAMINATION PAPER-2024

SCIENCE

(Solved)

Time allowed : 3 hours | Maximum Marks : 53

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **32 questions.** All questions are **compulsory.**

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

iii. **Section A** – questions number **1 to 14** are multiple choice questions Each question carries **1 marks.**

iv. **Section B** – questions number **15 to 22** are very short answer Each question carries **2 marks.**

v. **Section C** – questions number **23 to 28** are short answer Each question carries **3 marks.**

vi. **Section D** – questions number **29 to 31** are case based questions

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

Which of the following is a redox reaction, but not a combination reaction?

[1 Marks]

(A) $Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$

(B) $2\ Mg + O_2 \rightarrow 2\ MgO$

(C) $2\ H_2 + O_2 \rightarrow 2\ H_2O$

(D) $C + O_2 \rightarrow CO_2$

Question 2. The salt present in tooth enamel is:

[1 Marks]

(A) Calcium phosphate

(B) Sodium phosphate

(C) Aluminium phosphate

(D) Magnesium phosphate

Question 3. An aqueous solution of sodium chloride is prepared in distilled water. The pH of this solution is:

[1 Marks]

(A) 7

(B) 8

(C) 3

(D) 6

Question 4.

Select from the following the conditions responsible for the rapid spread of bread mould on a slice of bread:

(i) Formation of large number of spores

(ii) Presence of moisture and nutrients in bread

(iii) Low temperature

(iv) Presence of hyphae

[1 Marks]

(A) (iii) and (iv)

(B) (ii) and (iii)

(C) (ii) and (iv)

(D) (i) and (ii)

Question 5. The process in which transport of soluble products of photosynthesis takes place in plants is known as:

[1 Marks]

(A) Transpiration

(B) Evaporation

(C) Translocation

(D) Conduction

Question 6. Sense organ in which olfactory receptors are present is:

[1 Marks]

(A) Nose

(B) Skin

(C) Tongue

(D) Inner ear

Question 7. The incorrect statement about placenta is:

[1 Marks]

(A) It is a disc embedded in the uterine wall.

(B) It has a very small surface area for glucose and oxygen to pass from mother to the embryo.

(C) The embryo gets nutrition from the mother.

(D) It is formed only during pregnancy.

Question 8. How will the image formed by a convex lens be affected, if the upper half of the lens is wrapped with a black paper?

[1 Marks]

(A) The size of the image formed will be one-half of the size of the image due to the complete lens.

(B) The image of the upper half of the object will not be formed.

(C) The brightness of the image will reduce.

(D) The lower half of the inverted image will not be formed.

Question 9.

The phenomena of light involved in the formation of rainbow are:

[1 Marks]

(A) Refraction, reflection and dispersion

(B) Refraction, dispersion, scattering and total internal reflection

(C) Refraction, dispersion and internal reflection

(D) Reflection, dispersion and internal reflection

Question 10. The colour of light for which the refractive index of glass is minimum, is:

[1 Marks]

(A) Yellow

(B) Red

(C) Green

(D) Violet

Question 11. The current-carrying device which produces a magnetic field similar to that of a bar magnet is:

[1 Marks]

(A) A straight conductor

(B) A circular loop

(C) A circular coil

(D) A solenoid

Question 12.

A uniform magnetic field exists in the plane of paper as shown in the diagram. In this field, an electron

(e^-) and a positron (p^+) enter and shown. The electron and positron experience forces:

[1 Marks]

(A) both pointing into the plane of the paper.

(B) both pointing out of the plane of the paper.

(C) pointing into the plane of the paper and out of the plane of the paper respectively.

(D) pointing out of the plane of the paper and into the plane of the paper respectively.

Question 13. Which one of the following is not a natural ecosystem?

[1 Marks]

(A) Pond ecosystem

(B) Grassland ecosystem

(C) Forest ecosystem

(D) Cropland ecosystem

Question 14. A metal 'X' is used in thermit process. When 'X' is heated with oxygen, it gives an oxide 'Y', which is amphoteric in nature. 'X' and 'Y' respectively are :

[1 Marks]

(A) Mn, MnO_2

(B) Mg, MgO

(C) Al, Al_2O_3

(D) Fe, Fe_2O_3

Section B

Question 15.

Copper powder is taken in a china dish and heated over a burner. Name the product formed and state its colour. Write the chemical equation for the reaction involved.

[2 Marks]

Question 16. The melting and boiling points of carbon compounds are generally low and they are largely non-conductors of electricity. State two conclusions based on these two properties.

[2 Marks]

Question 17. Sometimes while running, the athletes suffer from muscle cramps. Why? How is respiration in this case different from aerobic respiration?

[2 Marks]

Question 18. Write the other name given to lymph. State its two functions.

[2 Marks]

Question 19. Some unicellular organisms such as Plasmodium and Leishmania differ in the manner in which they reproduce. Name and explain the reproductive process taking place in them.

[2 Marks]

Question 20.

The heat produced at a point due to concentration of sunlight by a convex lens burns a paper. (a)Explain why it happens. (b) Name the term given to the point at which the paper starts burning.

[2 Marks]

Question 21. An electric source can supply a charge of 500 coulomb. If the current drawn by a device is 25 mA, find the time in which the electric source will be discharged completely.

[2 Marks]

Question 22.

Write chemical equation for the chemical reaction which occurs when the aqueous solutions of barium chloride and sodium sulphate react together. Write the symbols of the ions present in the compound precipitated in the reaction.

[2 Marks]

Section C

Question 23. Study the experimental set-up shown in the diagram and write the 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.

[3 Marks]

Question 24. Name the ore of mercury and state the form in which it is found in nature. Write the chemical equations along with the conditions required for the reactions involved in the extraction of mercury from its ore.

[3 Marks]

Question 25. Taking the example of any two animal hormones along with their gland of secretion, explain how these hormones help (i) in growth and development and (ii) regulate metabolism, in the body.

[3 Marks]

Question 26. Study the diagram given below and answer the questions that follow: (i) Name the defect of vision depicted in this diagram stating the part of the eye responsible for this condition. (ii) List two causes of this defect. (iii) Name the type of lens used to correct this defect and state its role in this case.

[3 Marks]

Question 27. Differentiate between food chain and food web. In a food chain consisting of deer, grass, and tiger, if the population of deer decreases, what will happen to the population of organisms belonging to the first and third trophic levels?

[3 Marks]

Question 28.

What is dispersion of white light ? State its cause. Draw a diagram to show dispersion of a beam of white light by a glass prism.

[3 Marks]

Section D

Question 29. Carbon is a versatile element that forms the basis of all living organisms and many of the things we use. A large variety of compounds is formed because of its tetravalency. Compounds of carbon are formed with oxygen, hydrogen, nitrogen, sulphur, chlorine and many other elements.

(1) What are hydrocarbons?

[1 Marks]

(2) List two properties by virtue of which carbon can form a large number of compounds.

[1 Marks]

(3) Write the formula of the functional group present in (1) aldehydes, and (2) ketones. Write a chemical equation for the reaction that occurs between ethanoic acid and ethanol in the presence of a catalyst.

[2 Marks]

(4)

What are structural isomers? Write the structures of two

isomers of butane (C_4H_{10})

[2 Marks]

Question 30. Pollination is an important process in sexual reproduction of plants. It is an essential process that facilitates fertilisation in plants. Pollinating agents can be wind, water, insects and birds. Several changes take place in the flower after the fertilization has taken place.

(1) Name the part of the flower which attracts insects for pollination. What happens to this part after fertilisation?

[1 Marks]

(2) Write the main difference between self-pollination and cross-pollination.

[1 Marks]

(3) Define fertilisation. What is the fate of ovules and the ovary in a flower after fertilisation?

[2 Marks]

(4)

In a germinating seed, which parts are known as future

shoot and future root ? Mention the function of cotyledon.

[2 Marks]

Question 31.

A highly polished surface such as a mirror reflects most of the light falling on it. In our daily life we use two types of mirrors plane and spherical. The reflecting surface of a spherical mirrors may be curved inwards or outwards. In concave mirrors, reflection takes place from the inner surface, while in convex mirrors reflection takes place from the outer surface.

(1) A ray of light is incident on a concave mirror, parallel to its principal axis. If this ray after reflection from the mirror passes through the principal axis from a point at a distance of 10 cm from the pole of the mirror, find the radius of curvature of the mirror.

[1 Marks]

(2) Define the principal axis of a concave mirror.

[1 Marks]

(3) An object is placed at a distance of 10 cm from the pole of a convex mirror of focal length 15 cm. Find the position of the image.

[2 Marks]

(4)

A mirror forms a virtual, erect and diminished image of an

object. Identify the type of this mirror. Draw a ray diagram

to show the image formation in this case.

[2 Marks]

Section E

Question 32. Design an experiment to demonstrate that carbon dioxide is essential for photosynthesis. Write the observation and conclusion of the experiment.

[5 Marks]