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## CLASS X CBSE SCIENCE PRE-BOARD EXAM 2

*Time allowed : 3 hours*                                        *Maximum marks : 80*

*General Instructions :*

*(i)      The question paper comprises two Sections, A and B. You are to attempt both the sections.*

*(ii)      All questions are compulsory.*

*(iii)      All questions of Section A and Section B are to be attempted separately.*

*(iv)       There is an internal choice in three questions of three marks each, two questions of five marks each in Section A and in one question of two marks in Section B.*

*(v)      Question numbers 1 and 2 in Section A are one-mark questions. They are to be answered in one word or in one sentence.*

*(vi)      Question numbers 3 to 5 in Section A are two-marks questions. These are to be answered in about 30 words each.*

*(vii)      Question numbers 6 to 15 in Section A are three-marks questions. These are to be answered in about 50 words each.*

*(viii)      Question numbers 16 to 21 in Section A are five-marks questions. These are to be answered in about 70 words each.*

*(ix)      Question numbers 22 to 27 in Section B are based on practical skills. Each question is a two-marks question. These are to be answered in brief.*

## Section - A

1. List any two factors that could lead to speciation.
2. Write the number of covalent bonds in the molecule of butane.

## Section – B

3. An object is placed at a distance of 15 cm from a concave lens of focal length 30 cm. List four characteristic (nature, position ) of the image formed by the lens.

### (OR)

Draw a ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror and show the angle of incidence and angle of reflection on it.

4. Write the name and general formula of a chain of hydrocarbons in which an addition reaction with hydrogen is possible. State the essential condition for an addition reaction. Stating this condition, write a chemical equation giving the name of the reactant and the product of the reaction.
5. List four stakeholders which may be helpful in the conservation of forests.

## Section – C

6. Name the oxidising agent used for the conversion of ethanol to ethanoic acid. Distinguish between ethanol and ethanoic acid on the basis of (i) litmus test, (ii) reaction with sodium carbonate.

### (OR)

Write three different chemical reactions showing the conversion of ethanoic acid to sodium ethanoate. Write balanced chemical equation in each case. Write the name of the reactants and the products other ethanoic acid and sodium ethanoate in each case.

7. An element `X' belong to 3rd period and group 13 of the Modern Periodic Table. (a) Determine the valence electrons and the valency of `X'. (b) Molecular formula of the

compound formed when `X' reacts with an element `Y' (atomic number = 8). (c) Write the name and formula of the compound formed when `X' combines with chlorine.

8.  An element `X' has mass number 35 and number of neutrons 18. Write atomic number and electronic configuration of `X'. Also write group number, period number and valency of `X'.

9.  What is an organic evolution? It cannot be equated with progress. Explain with the help of a suitable example.

10. A star at times appears bright and at times fainter. What is this effect called? State the reason for this effect.

11. What is vegetative propagation? State two advantages and two disadvantages of this method.

**(OR)**

List three techniques that have been developed to prevent pregnancy. Which one of these techniques is not meant for males? How does the use of these techniques have a direct impact on the health and prosperity of a family?

12. The activities of man had adverse effects on all forms of living organisms in the biosphere. Unlimited exploitation of nature by man disturbed the delicate ecological balance between the living and non-living components of the biosphere. The unfavourable conditions created by man himself threatened the survival not only of himself but also of the entire living organisms on the mother earth. One of your classmates is an active member of `Eco club' of your school which is creating environmental awareness amongst the school students, spreading the same in the society and also working hard for preventing environmental degradation of the surroundings. (a) Why is it necessary to conserve our environment? (b) State the importance of green and blue dust-bins in the safe disposal of the household waste. (c) List two values exhibited by your classmate who is an active member of Eco-club of your school.

13. (a) Differentiate between alkanes and alkenes. Name and draw the structure of one member of each. (b) Alkanes generally burn with clean flame. Why?

**(OR)**

Write the name and general formula of a chain of hydrocarbons in which an addition reaction with hydrogen is possible. State the essential condition for an addition reaction. Stating this condition, write a chemical equation giving the name of the reactant and the product of the reaction.

14. A blue colour flower plant denoted by BB is crossbred with a white colour flower plant denoted by bb. (a) State the colour of flower you expect in their F1 generation plants. (b) What must be the percentage of white flower plants in F2 generation if flowers of F1 plants are self - pollinated? (c) State the expected ratio of the genotypes BB and Bb in the F2 progeny.

**(OR)**

How did Mendel explain that it is possible that a trait is inherited but not expressed in an organism?

15. What is periodicity in properties of elements with reference to the Modern Periodic Table? Why?

**Section – D**

16. (a) Define the term 'isomers' (b) Draw two possible isomers of the compound with molecular formula C3H6O and write their names. (c) Give the electron dot structures of the above two compounds.

17. An object of height 5 cm is placed perpendicular to the principal axis of a concave lens of focal length 10 cm. If the distance of the object from the optical centre of the lens is 20 cm, determine the position, nature and size of the image formed using the lens formula.

**(OR)**

The image formed by a spherical mirror is real, inverted and is of magnification –2. If the image is at a distance of 30 cm from the mirror, where is the object placed? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10 cm towards the mirror.

18. Explain with the help of a labeled circuit diagram how you will find the resistance of a combination of three resistors, of resistance R1, R2 and R3 joined in parallel. Also mention how you will connect the ammeter and the voltmeter in the circuit when measuring the current in the circuit and the potential difference across one of the three resistors of the combination.

19. Both soap and detergent are some type of salts. What is the difference between them? Describe in brief the cleansing action of soap. Why do soaps not form lather in hard water? List two problems that arise due to the use of detergents instead of soaps.

**(OR)**

List in tabular form three physical and two chemical properties on the basis of which ethanol and ethanoic acid can be differentiated .

20. (a) List the three events that occur during the process of photosynthesis. Explain the role of stomata in this process. (b) Describe an experiment to show that "sunlight is essential for photosynthesis".

21. What is a magnetic field? How can the direction of magnetic field lines at a placed be determined? (b) State the rule for the direction of the magnetic field produced around a current carrying conductor. Draw sketch of the pattern of field lines due to a current flowing through a straight conductor.

**(OR)**

(a) What is a solenoid? Draw a sketch of the pattern of field lines of the magnetic field through and around a current carrying solenoid. (b) Consider a circular loop of wire lying in the plane of the table. Let the current pass through the loop clockwise. Apply the right hand rule to find out the direction of the magnetic field inside and outside the loop.

**Section - E**

22. A student focuses the image of a candle flame, placed at about 2 m from a convex lens of focal length 10 cm, on a screen. After that he moves gradually the flame towards the lens and each time focuses its image on the screen.
(I) In which direction does he move the lens to focus the flame on the screen?
(II) What happens to the size of the image of the flame formed on the screen?
(III) What difference is seen in the intensity (brightness) of the image of the flame on the screen? (IV) What is seen on the screen when the flame is very close (at about 5 cm) to the lens?

23. The following vegetables are kept in a basket: Potato, Tomato, Radish, Brinjal, Carrot, Bottle - gourd . Which two of these vegetables correctly represent the homologous structures? (A) Carrot and Tomato (B) Potato and Brinjal (C) Radish and Carrot (D) Radish and Bottle-gourd.

24. When you add a few drops of acetic acid to a test-tube containing sodium bicarbonate powder, which one of the following is your observation? (A) No reaction takes place (B) A colorless gas with pungent smell is released with brisk effervescence (C) A brown colored gas is released with brisk effervescence (D) Formation of bubbles of a colorless and odorless gas Solution: (D) Formation of bubbles of a colorless and odourless gas.

25. Study the given ray diagrams and select the correct statement from the following:
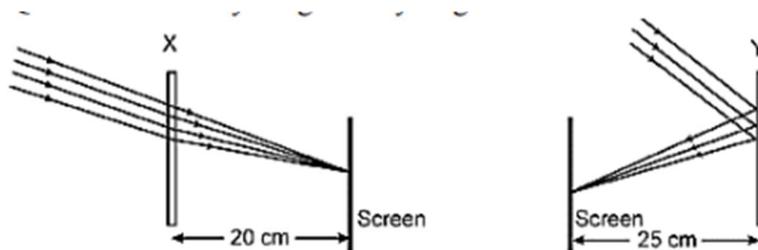


(A) Device X is a concave mirror and device Y is a convex lens, whose focal lengths are 20 cm and 25 cm respectively. (B) Device X is a convex lens and device Y is a concave mirror, whose focal lengths are 10 cm and 25 cm respectively (C) Device X is a concave lens and device Y is a convex mirror, whose focal lengths are 20 cm and 25 cm respectively. (D) Device X is a convex lens and device Y is a concave mirror, whose focal lengths are 20 cm and 25 cm respectively.

26. In an experiment to study the properties of acetic acid, a student takes about 2 ml of acetic acid in a dry test tube. He adds about 2 ml of water to it and shakes the test tube well. He is likely to observe that: (a) The acetic acid dissolves readily in water. (b) The solution becomes light orange. (c) Water floats over the surface of acetic acid. (d) Acetic acid floats over the surface of water.

27. Hard water required for an experiment is not available in a school laboratory. However, following salts are available in the laboratory. Select the salts which may be dissolved in water to make it hard for the experiment. 1. Calcium Sulphate 2. Sodium Sulphate 3. Calcium Chloride 4. Potassium Sulphate 5. Sodium Hydrogen Carbonate 6. Magnesium Chloride (a) 1, 2 and 4 (b) 1, 3 and 6 (c) 3, 5 and 6 (d) 2, 4 and 5