Mock Test – 1 (CBSE)

Time: 3 Hrs   **Max. Marks: 70**

General Instructions

1. All questions are compulsory.
2. Question numbers 1 to 8 are very short answer questions and carry 1 mark each.
3. Question numbers 9 to 18 are short answer questions and carry 2 marks each.
4. Question numbers 19 to 27 are also short answer questions and carry 3 marks each.
5. Question numbers 28 to 30 are long answer questions and carry 5 marks each.
6. Use log tables if necessary, use of calculators is not allowed.

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1. Why is liquid ammonia bottle first cooled in ice before opening it? (1)

2. What is meant by the term peptization? (1)

3. Write the monomers used for getting the following polymers:
   (a) Teflon
   (b) Polyvinyl chloride (1)

4. Write reaction for the preparation of phenol from cumene. (1)

5. Name two methods which are commonly used to convert a $>C = O$ group into a $>CH_2$ group. (1)

6. Name the medicine which can act both as an analgesic as well as an antipyretic. (1)

7. Give one chemical test to distinguish between C_2H_5Br and C_6H_5Br. (1)

8. Arrange the following compounds in increasing order of basic strength in their aqueous solutions: NH_3, CH_3NH_2, $(CH_3)_2NH$, $C_6H_5NH_2$, $(CH_3)_3N$. (1)

9. Explain each of the following with a suitable example:
   (a) Paramagnetism.
   (b) Frenkel defect in crystals. (2)

10. Draw a suitable diagram to express the relationship for ideal solutions of A and B between vapor pressures and mole fractions of components at constant temperature. (2)

11. A cell with N/50 KCl solution showed a resistance of 550 ohm at 25 °C. The specific conductivity of N/50 KCl at 25 °C is 0.002768 S cm^{-1}. The cell filled with N/10 $ZnSO_4$ solution at 25 °C shows a resistance of 72.18 ohm. Find the cell constant and molar conductivity of $ZnSO_4$ solution. (2)

12. Draw the open structure of face-centerd cubic unit cell. What is the total number of atoms per unit cell? (2)

13. What is a biodegradable polymer? Write the monomers of nylon-6 and neoprene. (2)

14. Describe actions of the following with suitable examples or state an example of each and function of the following:
   (a) Tranquillizers.
   (b) Broad-spectrum antibiotics. (2)

15. Write down the structure of the product of the following reactions.

    (a)
    $$CH_3 - \underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}} - Br \xrightarrow[C_2H_5OH]{C_2H_5ONa} ?$$

    (b) 3-Methyl-1-butene $\xrightarrow{HBr}$? (2)

16. What are enantiomers? Draw the structures of the possible enantiomers of 3-methylpent-1-ene. (2)

17. What is crystal field splitting energy? How does the magnitude of Δ_o decide the actual configuration of d orbitals in a coordination entity? (2)

18. How is the variability in the oxidation states of transition metals different from that of the non-transition metals? Illustrate with examples. (2)

19. Explain the following about the transition elements.
   (a) Magnetic behavior.
   (b) Oxidation states are variable.
   (c) Exhibit good catalytic properties.
   (d) Form interstitial compounds. (3)

20. (a) What are non-ideal solutions?
   (b) What role does the molecular interaction play in deciding the vapor pressure of solutions
       (i) alcohol and acetone?
       (ii) chloroform and acetone? (3)

21. The molar conductivities at infinite dilution of potassium chloride, hydrochloric acid and potassium acetate are 130.1, 379.4 and 95.6 S cm^2 mol^{-1}, respectively. Calculate the value of molar conductivity at infinite dilution for acetic acid. If the molar conductivity of a given acetic acid solution is 48.5 S cm^2 mol^{-1} at 25 °C, calculate the degree of dissociation of acetic acid at this temperature. (3)

22. Write chemical equations for the following processes:
   (a) Chlorine reacts with a hot concentrated solution of sodium hydroxide.
   (b) Orthophosphorous acid is heated.
   (c) PtF_6 and xenon are mixed together. (3)

23. How will you convert:
   (a) Phenol to benzoic acid?
   (b) Phenol to aspirin?
   (c) Benzene to phenol?
   (d) 1-propanol to 2-propanol?   (3)

24. Explain the following:
   (a) Denaturation of protein.
   (b) Two strands of DNA are not identical but complimentary to each other. Explain this statement.   (3)

25. Why do lyophilic sols not require any stabilizing agent for their preservation? How is colloidal sulphur in water prepared?   (3)

26. Describe how the following changes are brought about:
   (a) Pig iron into steel.
   (b) Zinc oxide into metallic zinc.
   (c) Impure titanium into pure titanium.

OR

Describe the role of
   (a) NaCN in the extraction of gold from gold ore.
   (b) SiO_2 in the extraction of copper from copper matte.   (3)

27. Distinguish between:
   (a) Benzylamine and N-methylaminobenzene
   (b) Dimethylaniline and Trimethylamine   (3)

28. Explain the following:
   (a) Electron gain enthalpy of fluorine is less negative than that of chlorine.
   (b) NH_3 has a higher boiling point than PH_3.
   (c) NH_3 is a good complexing reagent.
   (d) Nitrogen does not form any pentahalide.
   (e) $HClO_4$ is a stronger acid than $HClO_2$.   (5)

29. The rate law equation for the reaction $A \longrightarrow R$ is found to be $-\dfrac{d[A]}{dt} = k[A]^{1/2}$. If $[A]_0$ were the initial concentration of A, derive expressions for
   (a) rate constant in the integrated form.
   (b) half-life period of the reaction.   (5)

30. Explain why carboxyclic acids behave as acids? Discuss briefly the effect of electron-donating and electron-withdrawing substituents on the acidity of aliphatic carboxylic acids.   (5)