CLASS 12 – CHEMISTRY

MODEL QUESTION PAPER

(SET–4)

Time: 3 Hours   **Maximum Marks: 70**

General Instructions:

1. All questions are compulsory.

2. Use of calculator is not permitted.

3. Draw neat and labelled diagrams wherever required.

4. Internal choices are given in some questions.

Section A (1×16 = 16 Marks)

(12 MCQs + 4 Assertion–Reason)

Q1–Q12 MCQs

1. Which solution shows positive deviation from Raoult's law?
   (a) Benzene + Toluene
   (b) Ethanol + Water
   (c) n-Hexane + n-Heptane
   (d) Chlorobenzene + Bromobenzene

2. For a zero-order reaction, the graph between concentration and time is:
   (a) Exponential
   (b) Straight line
   (c) Parabola
   (d) Hyperbola

3. Which of the following is a monodentate ligand?
   (a) en
   (b) EDTA

(c) NH_3

(d) Oxalate

4. Which polymer is thermosetting?

    (a) PVC

    (b) Bakelite

    (c) Polythene

    (d) Teflon

5. Which compound does not give Tollen's test?

    (a) Formaldehyde

    (b) Acetaldehyde

    (c) Acetone

    (d) Benzaldehyde

6. Oxidation state of Fe in $FeSO_4$ is:

    (a) +1

    (b) +2

    (c) +3

    (d) +6

7. Which vitamin deficiency causes night blindness?

    (a) A

    (b) B

    (c) C

    (d) D

8. Geometry of SF_4 is:

    (a) Tetrahedral

    (b) See-saw

    (c) Trigonal planar

    (d) Octahedral

9. The unit of specific conductance is:

    (a) $S\ cm^2\ mol^{-1}$

    (b) $S\ cm^{-1}$

    (c) Ohm cm

    (d) $S\ mol^{-1}$

10. Which amine is tertiary?

    (a) CH_3NH_2

    (b) $(CH_3)_2NH$

    (c) $(CH_3)_3N$

    (d) NH_3

11. Which reaction is nucleophilic substitution?
    (a) Addition of H_2
    (b) Hydrolysis of alkyl halide
    (c) Combustion
    (d) Polymerisation

12. Example of aerosol is:
    (a) Milk
    (b) Paint
    (c) Smoke
    (d) Jelly

Assertion–Reason (Q13–Q16)

13. A: Boiling point increases on adding non-volatile solute.
    R: Vapour pressure decreases.

14. A: d-block elements show catalytic activity.
    R: Due to variable oxidation states.

15. A: Carboxylic acids are more acidic than alcohols.
    R: Carboxylate ion is resonance stabilised.

16. A: Increasing temperature increases rate of reaction.
    R: Number of effective collisions increases.

Section B (2×5 = 10 Marks)

17. Define colligative properties.

18. Write expression for Nernst equation.

19. Define coordination entity with example.

20. Give two differences between primary and secondary amines.

21. What is emulsification?

Section C (3×7 = 21 Marks)

22. Explain depression in freezing point with formula.

23. Derive integrated rate equation for zero order reaction.

24. Explain Valence Bond Theory for coordination compounds.

25. Describe Reimer–Tiemann reaction.

26. What are synthetic polymers? Give examples.

27. Explain types of adsorption.

28. Write preparation and properties of carboxylic acids.

Section D (Case Study Based) (4×2 = 8 Marks)

29. Case Study: Chemical Kinetics

A reaction has rate law: Rate = $k[A]^2$

(i) What is order of reaction?
(ii) What is unit of rate constant?
(iii) Write integrated rate equation.
(iv) Define half-life.

30. Case Study: Biomolecules

Sucrose on hydrolysis gives glucose and fructose.

(i) What type of sugar is sucrose?
(ii) Is sucrose reducing sugar?
(iii) Name the bond present in sucrose.
(iv) Define glycosidic bond.

Section E (Long question) (5×3 = 15 Marks)

31. Explain conductometric titration with diagram.

32. Describe Haloform reaction with mechanism.

33. Explain Crystal Field Theory for tetrahedral complex.