CLASS 12 – CHEMISTRY

MODEL QUESTION PAPER

(SET–10)

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 wherever applicable.

Section A (1×16 = 16 Marks)

(12 MCQs + 4 Assertion–Reason)

Q1–Q12 MCQs

1. Which colligative property is directly proportional to molarity?
   (a) Osmotic pressure
   (b) Elevation in boiling point
   (c) Depression in freezing point
   (d) Vapour pressure

2. For a first order reaction, the plot of log[A] vs time is:
   (a) Straight line with positive slope
   (b) Straight line with negative slope
   (c) Parabola
   (d) Hyperbola

3. Which of the following is an ambidentate ligand?
   (a) NH_3
   (b) H_2O

(c) NO_2^-

(d) CO

4. Which polymer is used in making non-stick cookware?
   (a) Nylon
   (b) Bakelite
   (c) Teflon
   (d) PVC

5. Which compound gives positive Fehling's test?
   (a) Benzaldehyde
   (b) Formaldehyde
   (c) Acetone
   (d) Toluene

6. Oxidation number of P in H_3PO_4 is:
   (a) +3
   (b) +5
   (c) +1
   (d) –3

7. Which vitamin deficiency causes rickets?
   (a) A
   (b) B
   (c) C
   (d) D

8. Hybridisation of SF_6 is:
   (a) sp^3
   (b) sp^3d
   (c) sp^3d^2
   (d) sp^2

9. In electrolytic cell, anode is:
   (a) Negative
   (b) Positive
   (c) Neutral
   (d) Salt bridge

10. Which compound does not undergo Cannizzaro reaction?
    (a) Formaldehyde
    (b) Benzaldehyde
    (c) Acetaldehyde
    (d) p-Nitrobenzaldehyde

11. For zero order reaction, rate is:
    (a) Dependent on concentration
    (b) Independent of concentration
    (c) Inversely proportional
    (d) Proportional to square

12. Which is example of lyophobic sol?
    (a) Starch sol
    (b) Gold sol
    (c) Gelatin
    (d) Gum

Assertion–Reason (Q13–Q16)

13. A: Boiling point elevation depends on number of solute particles.
    R: It is a colligative property.

14. A: Coordination compounds may show geometrical isomerism.
    R: Due to different spatial arrangement of ligands.

15. A: Phenol is acidic in nature.
    R: Phenoxide ion is resonance stabilised.

16. A: Increasing temperature increases rate constant.
    R: According to Arrhenius equation.

Section B (2×5 = 10 Marks)

17. Define mole fraction.

18. Write Nernst equation.

19. Define chelating ligand with example.

20. Write two differences between SN1 and SN2 reactions.

21. What are carbohydrates? Give two examples.

Section C (3×7 = 21 Marks)

22. Explain Raoult's law and its limitations.

23. Derive integrated rate equation for zero order reaction.

24. Explain Valence Bond Theory for octahedral complexes.

25. Describe Hoffmann bromamide reaction.

26. What are biodegradable polymers? Write advantages.

27. Explain Tyndall effect and Brownian movement.

28. Write preparation and properties of alcohols.

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

29. Case Study: Electrochemistry

$E°(Zn^{2+}/Zn) = –0.76$ V
$E°(Ag^+/Ag) = +0.80$ V

(i) Identify anode and cathode.
(ii) Calculate E°cell.
(iii) Write cell reaction.
(iv) Define standard EMF.

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30. Case Study: Proteins

Proteins are polypeptides formed from amino acids.

(i) What is primary structure?
(ii) Define peptide bond.
(iii) What is denaturation?
(iv) Name one globular protein.

Section E (Long Answer Type) (5×3 = 15 Marks)

31. Explain Kohlrausch's law and its applications.

32. Describe Aldol condensation with mechanism.

33. Explain Crystal Field Theory and splitting in octahedral complex.