CLASS 12 – CHEMISTRY

MODEL QUESTION PAPER

(SET–7)

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 of the following is an example of minimum boiling azeotrope?
   (a) HCl + Water
   (b) Ethanol + Water
   (c) Benzene + Toluene
   (d) Acetone + Chloroform

2. For a second order reaction, the unit of rate constant is:
   (a) s^{-1}
   (b) $mol\ L^{-1}\ s^{-1}$
   (c) $L\ mol^{-1}\ s^{-1}$
   (d) $L^{2}\ mol^{-2}\ s^{-1}$

3. Which ligand forms chelate ring?
   (a) NH_3
   (b) H_2O

(c) Ethylenediamine (en)
(d) Cl^-

4. Which of the following is a thermoplastic polymer?
   (a) Bakelite
   (b) Melamine
   (c) PVC
   (d) Urea-formaldehyde resin

5. Which compound gives positive Iodoform test?
   (a) Methanol
   (b) Ethanol
   (c) Benzene
   (d) Formic acid

6. Oxidation number of Cl in $KClO_3$ is:
   (a) +3
   (b) +5
   (c) +7
   (d) –1

7. Which vitamin prevents scurvy?
   (a) Vitamin A
   (b) Vitamin B
   (c) Vitamin C
   (d) Vitamin D

8. Shape of XeF_2 molecule is:
   (a) Linear
   (b) Tetrahedral
   (c) Square planar
   (d) Trigonal bipyramidal

9. In electrolysis, reduction takes place at:
   (a) Anode
   (b) Cathode
   (c) Salt bridge
   (d) Electrolyte

10. Which compound undergoes aldol condensation?
    (a) Formaldehyde
    (b) Acetaldehyde
    (c) Benzaldehyde
    (d) Methanol

11. The half-life of zero order reaction is:
    (a) Independent of concentration
    (b) Directly proportional to initial concentration
    (c) Inversely proportional to initial concentration
    (d) Constant

12. Which is an example of emulsion?
    (a) Smoke
    (b) Fog
    (c) Milk
    (d) Foam

Assertion–Reason (Q13–Q16)

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

14. A: Transition metals form complex compounds.
    R: Due to presence of vacant d-orbitals.

15. A: Phenol is weak acid.
    R: It does not dissociate in water.

16. A: Catalyst increases rate of reaction.
    R: It lowers activation energy.

Section B (2×5 = 10 Marks)

17. Define Henry’s law.

18. Write integrated rate equation for first order reaction.

19. What is coordination number? Give example.

20. Write two differences between soaps and detergents.

21. Define peptide bond.

Section C (3×7 = 21 Marks)

22. Explain deviation from Raoult’s law.

23. Derive expression for half-life of second order reaction.

24. Explain Crystal Field Theory for tetrahedral complex.
25. Describe Reimer–Tiemann reaction with equation.
26. What are drugs? Classify them with examples.
27. Explain electrophoresis.
28. Write preparation and properties of phenols.

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

29. Case Study: Electrochemical Cell

Standard electrode potentials:
$E°(Ag^{+}/Ag) = +0.80$ V
$E°(Zn^{2+}/Zn) = -0.76$ V

(i) Identify anode and cathode.
(ii) Calculate $E°_{cell}$.
(iii) Write cell reaction.
(iv) Is cell spontaneous?

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30. Case Study: Carbohydrates

Glucose reacts with bromine water but not with $NaHSO_3$.

(i) What functional group is present in glucose?
(ii) Why does it not react with $NaHSO_3$?
(iii) Define mutarotation.
(iv) Is glucose reducing sugar?

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

31. Explain Kohlrausch's law and its applications.
32. Describe Cannizzaro reaction with mechanism.
33. Explain types of isomerism in coordination compounds.