CLASS 12 – CHEMISTRY

MODEL QUESTION PAPER

(SET–5)

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 ideal solution?
   (a) Benzene + Toluene
   (b) Acetone + Chloroform
   (c) Ethanol + Water
   (d) HCl + Water

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

3. Which ligand is hexadentate?
   (a) NH_3
   (b) en

(c) EDTA
(d) Cl^-

4. Which of the following is elastomer?
   (a) Buna-S
   (b) Nylon-6
   (c) PVC
   (d) Bakelite

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

6. Oxidation state of Ni in $[Ni(CO)_4]$ is:
   (a) 0
   (b) +2
   (c) +4
   (d) –2

7. Which vitamin is water soluble?
   (a) A
   (b) D
   (c) E
   (d) C

8. Hybridisation of XeF_4 is:
   (a) sp^3
   (b) sp^3d
   (c) sp^3d^2
   (d) sp^2

9. In electrolytic cell, oxidation occurs at:
   (a) Cathode
   (b) Anode
   (c) Salt bridge
   (d) Solution

10. Which is primary amine?
    (a) $(CH_3)_2NH$
    (b) $(CH_3)_3N$
    (c) CH_3NH_2
    (d) NH_4Cl

11. Half life of zero order reaction depends on:
    (a) Rate constant only
    (b) Initial concentration
    (c) Temperature only
    (d) Pressure

12. Which is an example of sol?
    (a) Jelly
    (b) Fog
    (c) Smoke
    (d) Paint

Assertion–Reason (Q13–Q16)

13. A: Osmotic pressure increases with concentration.
    R: It depends on number of solute particles.

14. A: Lanthanides show +3 oxidation state.
    R: Due to loss of 4f electrons.

15. A: Alcohols are less acidic than phenols.
    R: Alkoxide ion is less stabilised.

16. A: Catalyst does not change equilibrium constant.
    R: It affects forward and backward reaction equally.

Section B (2×5 = 10 Marks)

17. Define mole fraction.

18. State Faraday's first law of electrolysis.

19. What is ambidentate ligand? Give example.

20. Write two differences between addition and condensation polymerisation.

21. What are vitamins? Give two examples.

Section C (3×7 = 21 Marks)

22. Explain osmotic pressure and its applications.

23. Derive rate equation for second order reaction (same reactants).

24. Explain geometrical isomerism in coordination compounds.
25. Describe Clemmensen reduction.
26. What are soaps and detergents? Write cleansing action of soap.
27. Explain Langmuir adsorption isotherm.
28. Write preparation and properties of ketones.

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

29. Case Study: Solutions

A solution contains 1 mole of solute dissolved in 1 kg of solvent.

(i) Define molality.
(ii) Calculate molality of solution.
(iii) What happens to boiling point?
(iv) Define van't Hoff factor.

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30. Case Study: Coordination Compound

$[Fe(CN)_6]^{4-}$

(i) Find oxidation state of Fe.
(ii) What is coordination number?
(iii) Is CN^- strong field ligand?
(iv) Name the complex ion.

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

31. Explain Kohlrausch's law and its applications.
32. Describe Cross Aldol condensation with mechanism.
33. Explain types of drugs with examples.