

CLASS 12 – CHEMISTRY
MODEL QUESTION PAPER
(SET-9)

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.
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Section A (1×16 = 16 Marks)

(12 MCQs + 4 Assertion–Reason)

Q1–Q12 MCQs

1. Which of the following is an example of negative deviation from Raoult's law?
(a) Benzene + Toluene
(b) Acetone + Chloroform
(c) n-Hexane + n-Heptane
(d) Chlorobenzene + Bromobenzene
2. The slope of plot of $\log k$ vs $1/T$ gives:
(a) R
(b) $-E_a/2.303R$
(c) E_a
(d) k
3. Which complex is square planar?
(a) $[\text{NiCl}_4]^{2-}$
(b) $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$

- (c) $[\text{Co}(\text{NH}_3)_6]^{3+}$
(d) $[\text{ZnCl}_4]^{2-}$
4. Which polymer is formed by condensation polymerisation?
(a) Polythene
(b) PVC
(c) Nylon-6,6
(d) Teflon
5. Which compound does not give Iodoform test?
(a) Ethanol
(b) Acetone
(c) Methanol
(d) Acetaldehyde
6. Oxidation state of N in HNO_3 is:
(a) +3
(b) +5
(c) +1
(d) -3
7. Which vitamin is essential for blood clotting?
(a) A
(b) C
(c) D
(d) K
8. Hybridisation in ClF_3 is:
(a) sp^3
(b) sp^3d
(c) sp^3d^2
(d) sp^2
9. In galvanic cell, electrons flow from:
(a) Cathode to anode
(b) Anode to cathode
(c) Salt bridge
(d) Electrolyte
10. Which compound undergoes Cannizzaro reaction?
(a) Acetaldehyde
(b) Benzaldehyde
(c) Propanone
(d) Ethanol

11. For second order reaction, half-life is:
- (a) Independent of concentration
 - (b) Directly proportional to concentration
 - (c) Inversely proportional to initial concentration
 - (d) Constant
12. Which is example of gel?
- (a) Milk
 - (b) Jelly
 - (c) Smoke
 - (d) Foam
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Assertion–Reason (Q13–Q16)

13. A: Relative lowering of vapour pressure is a colligative property.
R: It depends only on number of solute particles.
14. A: Complex compounds may show linkage isomerism.
R: Due to presence of ambidentate ligands.
15. A: Amines are more basic than ammonia.
R: Alkyl groups have +I effect.
16. A: Increasing temperature increases rate of reaction.
R: It decreases activation energy.
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Section B (2×5 = 10 Marks)

17. Define abnormal molar mass.
18. State Arrhenius equation.
19. What is chelation? Give example.
20. Write two differences between aldehydes and carboxylic acids.
21. What are nucleic acids?
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Section C (3×7 = 21 Marks)

22. Explain depression in freezing point and derive its formula.
23. Derive integrated rate equation for first order reaction.

24. Explain Crystal Field Splitting in octahedral complex.
 25. Describe Aldol condensation with mechanism.
 26. What are synthetic polymers? Classify them.
 27. Explain coagulation of colloids.
 28. Write preparation and properties of haloalkanes.
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Section D (Case Study Based) (4×2 = 8 Marks)

29. Case Study: Electrochemical Cell

$$E^\circ(\text{Cu}^{2+}/\text{Cu}) = +0.34 \text{ V}$$

$$E^\circ(\text{Ag}^+/\text{Ag}) = +0.80 \text{ V}$$

- (i) Which electrode acts as anode?
 - (ii) Calculate E°_{cell} .
 - (iii) Write overall cell reaction.
 - (iv) Define EMF.
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30. Case Study: Amino Acids

Amino acids exist as zwitter ions.

- (i) What is zwitter ion?
 - (ii) Define isoelectric point.
 - (iii) What type of bond forms proteins?
 - (iv) Name one essential amino acid.
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Section E (Long question) (5×3 = 15 Marks)

31. Explain Nernst equation and its applications.
32. Describe Reimer–Tiemann reaction with mechanism.
33. Explain types of isomerism in coordination compounds.