CLASS 12 – CHEMISTRY

ANSWER KEY

(SET–6)

Section A (1×16 = 16 Marks)

Q1. (b) Osmotic pressure

Q2. (b) L mol^{-1} s^{-1}

Q3. (b) $[Pt(NH_3)_2Cl_2]$

Q4. (b) PHBV

Q5. (b) Aldehyde

Q6. (b) +6

Q7. (d) Vitamin D

Q8. (c) sp^3d^3

Q9. (b) Cathode

Q10. (b) Benzaldehyde

Q11. (a) 0.693/k

Q12. (b) Whipped cream

Assertion–Reason

13. ✓ Both A and R are true and R is correct explanation.

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Section B (2 Marks Each)

Q17. van't Hoff Factor

Definition:
It is the ratio of actual number of particles in solution to expected number.

$$i = \frac{\text{Observed molar mass}}{\text{Normal molar mass}}$$

Q18. Faraday's Second Law

When same quantity of electricity is passed through different electrolytes, masses deposited are proportional to their equivalent weights.

Q19. Ligand

Atom or molecule that donates lone pair to central metal atom.

Example: NH_3

Q20. Difference between Aldehydes and Ketones

Aldehydes	Ketones
–CHO group	–CO– group
Easily oxidised	Not easily oxidised
Give Tollen's test	Do not give

Q21. Enzymes

Biological catalysts made of proteins that speed up biochemical reactions.

Section C (3 Marks Each)

Q22. Abnormal Molar Mass

Occurs due to association or dissociation.

Association → Higher molar mass
Dissociation → Lower molar mass

Corrected by van't Hoff factor.

Q23. Second Order Rate Equation

For 2A → Products:

$$\frac{1}{[A]} = \frac{1}{[A]_0} + kt$$

Half-life:

$$t_{1/2} = \frac{1}{k[A]_0}$$

Q24. Crystal Field Theory (Octahedral)

d orbitals split into:

- t_2g (lower)
- e_g (higher)

Energy gap = Δ_0

Strong field → Low spin
Weak field → High spin

Q25. Hoffmann Bromamide Reaction

$$RCONH_2 + Br_2 + 4KOH \rightarrow RNH_2 + K_2CO_3 + 2KBr + 2H_2O$$

Produces primary amine with one carbon less.

Q26. Synthetic Detergents

Synthetic cleaning agents effective in hard water.

Advantages:

1. Work in hard water
2. More effective cleansing

Q27. Freundlich Adsorption Isotherm

$$\frac{x}{m} = kP^{1/n}$$

Taking log:

$$\log \frac{x}{m} = \log\ k + \frac{1}{n}\log\ P$$

Q28. Preparation & Properties of Amines

Preparation:

Reduction of nitro compound:

$$RNO_2 \rightarrow RNH_2$$

Properties:

1. Basic nature
2. Diazotisation (aromatic amines)

Section D (Case Study)

Q29. Electrochemistry

$E°(Zn^{2+}/Zn) = –0.76$ V
$E°(Cu^{2+}/Cu) = +0.34$ V

(i) Anode: Zn

(ii) Cathode: Cu

(iii) E°cell:

$$E°cell = E°cathode - E°anode$$

$$= 0.34 - (-0.76) = 1.10V$$

(iv) Yes, reaction is spontaneous (positive EMF).

Q30. Proteins

(i) Peptide bond

(ii) Peptide bond: –CO–NH– linkage

(iii) Types:

1. Fibrous
2. Globular

(iv) Denaturation: Loss of secondary & tertiary structure due to heat or chemicals.

Section E (5 Marks Each)

Q31. Electrochemical Series

Arrangement of elements according to standard reduction potential.

Applications:

1. Predict spontaneity
2. Compare oxidising power
3. Calculate EMF

Q32. Aldol Condensation

Reaction of aldehyde with α-H in presence of base.

Mechanism:

1. Enolate formation
2. Nucleophilic attack
3. Dehydration

Q33. Classification of Polymers

1. Addition polymers – Polythene
2. Condensation polymers – Nylon
3. Thermoplastics – PVC
4. Thermosetting – Bakelite