CLASS 12 – CHEMISTRY

ANSWER KEY

(SET–4)

Section A (1×16 = 16 Marks)

Q1. (b) Ethanol + Water

Q2. (b) Straight line

Q3. (c) NH_3

Q4. (b) Bakelite

Q5. (c) Acetone

Q6. (b) +2

Q7. (a) Vitamin A

Q8. (b) See-saw

Q9. (b) S cm^{-1}

Q10. (c) $(CH_3)_3N$

Q11. (b) Hydrolysis of alkyl halide

Q12. (c) Smoke

Assertion–Reason

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

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

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

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

Section B (2 Marks Each)

Q17. Colligative Properties

Definition:
Those properties of solutions which depend only on number of solute particles and not on their nature are called colligative properties.

Examples:

1. Elevation in boiling point

2. Depression in freezing point

3. Osmotic pressure

Q18. Nernst Equation

$$E = E^0 - \frac{RT}{nF} \ln \ Q$$

At 298K:

$$E = E^0 - \frac{0.0591}{n} \log \ Q$$

Q19. Coordination Entity

A complex ion having central metal atom bonded with ligands is called coordination entity.

Example:
$[Co(NH_3)_6]^{3+}$

Q20. Difference between Primary and Secondary Amines

Primary Amine	Secondary Amine
One alkyl group	Two alkyl groups
RNH_2	R_2NH

Primary Amine   Secondary Amine

Give carbylamine test Do not give

Q21. Emulsification

Process of breaking large fat globules into small droplets with help of emulsifier (soap).

Section C (3 Marks Each)

Q22. Depression in Freezing Point

Freezing point decreases when solute is added.

$$\Delta T_f = K_f m$$

Where:
Kf = Freezing point constant
m = Molality

Q23. Integrated Rate Equation (Zero Order)

For zero order reaction:

$$[A] = [A]_0 - kt$$

Half-life:

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

Q24. Valence Bond Theory

1. Metal orbitals hybridise.

2. Ligands donate electron pairs.

3. Hybrid orbitals form coordinate bonds.

Example:
[Co(NH$_3$)$_6$]$^{3+}$ → sp^{3}d^2 hybridisation

Q25. Reimer–Tiemann Reaction

Phenol reacts with CHCl$_3$ and NaOH to give salicylaldehyde.

$$C_6H_5OH + CHCl_3 + NaOH \rightarrow C_6H_4(OH)CHO$$

Q26. Synthetic Polymers

Man-made polymers.

Examples:

1. Nylon

2. PVC

3. Polythene

Q27. Types of Adsorption

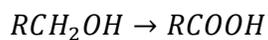1. Physical adsorption

2. Chemical adsorption

Physical: Weak forces
Chemical: Strong chemical bonds

Q28. Preparation & Properties of Carboxylic Acids

Preparation:

Oxidation of alcohol:

$$RCH_2OH \rightarrow RCOOH$$

Properties:

1. Acidic nature

2. Esterification

3. Reaction with metals

Section D (Case Study)

Q29. Rate = k[A]^2

(i) Order = 2

(ii) Unit of k = $L \, mol^{-1} \, s^{-1}$

(iii) Integrated equation:

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

(iv) Half-life:
Time required to reduce concentration to half.

Q30. Sucrose

(i) Disaccharide

(ii) No, non-reducing sugar

(iii) Glycosidic bond

(iv) Bond formed between two monosaccharides.

Section E (5 Marks Each)

Q31. Conductometric Titration

Conductance measured during titration.

At equivalence point, change in conductance observed.

(Exam में neat labelled graph बनाना चाहिए)

Q32. Haloform Reaction

Methyl ketone reacts with halogen in presence of base.

$$CH_3COCH_3 + 3Cl_2 + 4NaOH \rightarrow CHCl_3 + CH_3COONa$$

Mechanism:

1. Halogenation

2. Cleavage

Q33. Crystal Field Theory (Tetrahedral)

d orbitals split into:

- e (lower)

- t_2 (higher)

Splitting energy = Δt

$\Delta t < \Delta_0$