

# CLASS 12 – CHEMISTRY

## ANSWER KEY

### (SET-3)

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#### Section A (1×16 = 16 Marks)

Q1. (b) Acetone + Chloroform

Q2. (a) 0

Q3. (c) en

Q4. (c) Nylon-6,6

Q5. (b) Ethanol

Q6. (b)  $sp^3d$

Q7. (d) K

Q8. (d) +7

Q9. (a)  $CN^-$

Q10. (a) Volt

Q11. (b) Primary haloalkane

Q12. (b) Jelly

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#### 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. ✓ A is true but R is false.

(Catalyst lowers activation energy.)

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## Section B (2 Marks Each)

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### Q17. Molarity

**Definition:**

Molarity (M) is defined as the number of moles of solute dissolved per litre of solution.

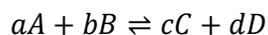
$$M = \frac{\text{Moles of solute}}{\text{Volume of solution in litre}}$$

Unit: mol L<sup>-1</sup>

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### Q18. Expression for Equilibrium Constant (K<sub>c</sub>)

For reaction:



$$K_c = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

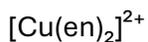
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### Q19. Chelation

**Definition:**

Formation of cyclic complex by multidentate ligand is called chelation.

Example:



### Q20. Difference between Lyophobic & Lyophilic Sols

Lyophobic	Lyophilic
Less affinity	High affinity
Easily coagulated	Stable
Irreversible	Reversible

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### Q21. Reducing Sugars

Sugars that reduce Tollen's or Fehling's solution are called reducing sugars.

Example: Glucose

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## Section C (3 Marks Each)

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### Q22. Relative Lowering of Vapour Pressure

$$\frac{P^0 - P}{P^0} = X_B$$

Where:

$P^0$  = Vapour pressure of pure solvent

$P$  = Vapour pressure of solution

$X_B$  = Mole fraction of solute

It is a colligative property.

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### Q23. Half-Life (First Order Reaction)

Integrated equation:

$$k = \frac{2.303}{t} \log \frac{[A]_0}{[A]}$$

At half-life:

$$t_{1/2} = \frac{0.693}{k}$$

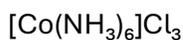
Independent of concentration.

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### Q24. Werner's Theory

1. Metal shows two valencies:
  - Primary valency (ionisable)
  - Secondary valency (coordination number)
2. Secondary valencies are directional.

Example:



### Q25. Hoffmann Bromamide Reaction

Primary amide treated with  $\text{Br}_2$  and  $\text{KOH}$  gives primary amine with one carbon less.



### Q26. Antiseptics and Disinfectants

**Antiseptics:** Applied on living tissues.

Example: Dettol

**Disinfectants:** Applied on non-living surfaces.

Example: Phenol

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### Q27. Freundlich Adsorption Isotherm

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

Taking log:

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

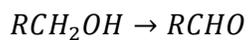
Graph: Straight line.

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### Q28. Preparation & Properties of Aldehydes

**Preparation:**

Oxidation of alcohol:



**Properties:**

1. Tollen's test

2. Aldol condensation

3. Reduction

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## Section D (Case Study)

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### Q29. $[\text{Co}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$

(i) Oxidation state of Co:

Let x be oxidation state:

$$x + 0 \times 5 + (-1) = +2$$

$$x = +3$$

(ii) Coordination number = 6

(iii) Name: Pentaamminechlorocobalt(III) chloride

(iv) Yes, it is electrolyte because it gives  $\text{Cl}^-$  ions in solution.

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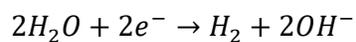
### Q30. Electrolysis of Aqueous NaCl

(i) Cathode:  $\text{H}_2$  gas

(ii) Anode:  $\text{Cl}_2$  gas

(iii) Half reactions:

Cathode:



Anode:



(iv) Faraday's Law:

Mass deposited is proportional to quantity of electricity passed.

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## Section E (5 Marks Each)

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**Q31. Electrochemical Series**

Arrangement of elements according to standard reduction potentials.

**Applications:**

1. Predict spontaneity
  2. Compare oxidising/reducing power
  3. Calculate EMF
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**Q32. Cannizzaro Reaction**

Aldehydes without  $\alpha$ -hydrogen undergo disproportionation.

Example:



Mechanism:

1. Nucleophilic attack
  2. Hydride transfer
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**Q33. Types of Polymerisation**

1. Addition Polymerisation  
Example: Polythene
2. Condensation Polymerisation  
Example: Nylon-6,6