



CHEMISTRY

Class 12 - Chemistry

Time Allowed: 3 hours

Maximum Marks: 70

General Instructions:

The question paper is divided into **four sections**:

1. Section A

- Q. No. 1 contains **Ten multiple choice type** of questions carrying **One mark** each.
- Q. No. 2 contains **Eight very short answer type** of questions carrying **One mark** each.

2. Section B

- Q. No. 3 to Q. No. 14 contain **Twelve short answer type** of questions carrying **Two marks** each. (Attempt any Eight).

3. Section C

- Q. No. 15 to Q. No. 26 contain **Twelve short answer type** of questions carrying **Three marks** each. (Attempt any Eight).

4. Section D

- Q. No. 27 to Q. No. 31 contain **Five long answer type** of questions carrying **Four marks** each. (Attempt any Three).

5. Use of the log table is allowed. Use of calculator is not allowed.

6. Figures to the right indicate full marks.

7. For each MCQ, correct answer must be written along with its alphabet. e.g., (a).... / (b) / (c)..... / (d)..... Only first attempt will be considered for evaluation.

8. Physical constants:- i) ----- ii) ----- iii) -----

Section A

1. Select and write the correct answer:

[10]

(a) p-type semi-conductors are made by mixing silicon with impurities of _____.

[1]

a) antimony

b) arsenic

c) germanium

d) boron

(b) The pH of weak monoacidic base is 11.2, its OH^- ion concentration is:

[1]

a) $1.585 \times 10^{-11} \text{ mol dm}^{-3}$

b) $3.010 \times 10^{-3} \text{ mol dm}^{-3}$

c) $3.010 \times 10^{-11} \text{ mol dm}^{-3}$

d) $1.585 \times 10^{-3} \text{ mol dm}^{-3}$

4. Define van't Hoff factor. How is it related to the degree of dissociation? [2]
5. Define nanochemistry. [2]
6. What happens when phenol is heated with zinc dust? [2]
7. Write a note on Friedel Craft's acylation. [2]
8. Give the limitations of Arrhenius theory of acids and bases. [2]
9. What is the action of benzene sulphonyl chloride on ethanamine? [2]
10. For a certain reaction ΔH° is -224kJ and ΔS° is -153J K^{-1} . At what temperature the change over from spontaneous to nonspontaneous will occur? [2]
11. What are amino acids? Write the correct reaction for formation of peptide bond between amino acids. [2]
12. Write the correct condition for spontaneity in terms of Gibbs energy. [2]
13. Write chemical reactions to prepare the following polymers: [2]
 - i. Teflon
 - ii. Nylon 6
14. Explain anomalous behaviour of oxygen in group 16 with respect to: [2]
 - i. Atomicity
 - ii. Magnetic property
 - iii. Oxidation state

Section C

Attempt any 8 questions

15. Define the following terms: [3]
 - i. Isotonic solution
 - ii. Hypertonic solution
 - iii. Hypotonic solution
16. Explain metal deficiency defect with example. [3]
17. How much electricity in terms of Faraday is required to produce: [3]
 - i. 20 g of Ca from molten CaCl_2
 - ii. 40 g of Al from molten Al_2O_3

[Given: Molar mass of calcium and aluminium are 40 g mol^{-1} and 27 g mol^{-1} respectively.]
18. How is propene converted into 1-bromopropane and 2-bromopropane? [3]
19. For the reaction: [3]

$$\text{N}_2\text{O}_4 \rightarrow 2\text{NO}_2$$

$$\begin{matrix} \text{(g)} & & \text{(g)} \end{matrix}$$

$$\left(\Delta H^\circ = +57.24\text{ kJ}, \Delta S^\circ = 175.8\text{ J K}^{-1} \right)$$

At what temperature the reaction will be spontaneous?
20. How is potassium dichromate prepared from chrome iron ore? [3]
21. Solubility product of magnesium hydroxide is 1.4×10^{-11} . Calculate the solubility of magnesium hydroxide. [3]
22. Explain cationic complexes and anionic complexes of coordination compounds. [3]
23. Distinguish between molecularity and order of reaction. [3]
24. Write the structure and IUPAC names of isomeric aldehydes having molecular formula $\text{C}_5\text{H}_{10}\text{O}$. [3]
25. Write any **four points** of difference between fluorine and other halogens. [3]
26. **Answer the following:** [3]
 - (a) Convert: Dry ice into acetic acid. [2]

- (b) What is the action of benzene diazonium chloride on ethanol? [1]

Section D

Attempt any 3 questions

27. **Answer the following:** [4]
- (a) Write Arrhenius equation. Derive an expression for temperature variations. [2]
 - (b) Calculate magnetic moment of $Fe^{2+}_{(aq)}$ ion [$Z = 26$]. [1]
 - (c) Write the name of nanostructured material used in car tyres to increase the life of tyres. [1]
28. **Answer the following:** [4]
- (a) Under what conditions work done by a gas is **zero**? [2]
 - (b) Define vulcanization. [1]
 - (c) State the function of insulin. [1]
29. **Answer the following:** [4]
- (a) Face centred cubic crystal lattice of copper has density of 8.966 g cm^{-3} . Calculate the volume of the unit cell. [2]
[Given: Molar mass of copper is 63.5 g mol^{-1} and Avogadro number N_A is $6.022 \times 10^{23} \text{ mol}^{-1}$]
 - (b) Complete and rewrite the balanced chemical equation for the following reactions: [2]
 - i. Benzaldehyde $\xrightarrow{50\%KOH}$?
 - ii. Acetone + phenylhydrazine $\xrightarrow{H^+}$?
30. **Answer the following:** [4]
- (a) Define ligand. [2]
 - (b) Write SI unit of molar conductivity. [1]
 - (c) Write the chemical composition of cryolite. [1]
31. **Answer the following:** [4]
- (a) i. What are ethers? [2]
ii. How are they classified?
 - (b) How is oxygen prepared from PbO_2 ? [2]