

0223

SET -

Total No. of Questions - **33**

Regd.

Total No. of Printed Pages - **3**

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Part - III**CHEMISTRY, Paper - II****(English Version)****MODEL Paper - I****(For the Academic Year 2021-22 only)****Time : 3 Hours****Max. Marks : 60****SECTION - A****10 × 2 = 20****Note:** (i) Answer **ANY TEN** Questions(ii) Each Question carries **TWO** marks

(iii) All are very short answer type questions.

1. What is the coordination number of atoms in a cubic close-pack structure?
2. How many lattice points are there in one unit cell of face-centered cubic lattice?
3. What is Schottky defect?
4. Define mole fraction.
5. State Henry's law.
6. Define osmotic pressure.
7. The moist air becomes dry in the presence of silica gel. Give reason for this.
8. Amongst SO₂, H₂ which will be adsorbed more readily on the surface of charcoal and why ?
9. Nitrogen molecule is highly stable – Why ?

10. Draw the structure of ClF_3 .
11. What is an ambidentate ligand? Give example.
12. What is Zwitter ion? Give an example.
13. What are fibrous proteins? Give examples.
14. Ethanol with H_2SO_4 at 443K forms ethane while at 413 K it forms ethoxy ethane. Explain the mechanism.
15. An organic acid with molecular formula $\text{C}_8\text{H}_8\text{O}_2$ on decarboxylation forms Toluene. Identify the organic acid.

SECTION - B

6 × 4 = 24

- Note:**
- (i) Answer **ANY SIX** questions.
 - (ii) Each question carries **FOUR** marks.
 - (iii) All are of short answer type questions.
16. Derive Bragg's equation.
 17. What is electrolysis? Give Faraday's first law of electrolysis.
 18. What do you understand by the terms given below
 - (a) Absorption
 - (b) Adsorption
 - (c) Adsorbent and Adsorbate
 19. What are lyophilic and lyophobic sols? Compare the two terms in terms of stability and reversibility.
 20. How does P_4 react with the following?
 - a) SOCl_2
 - b) SO_2 Cl_2
 21. How can you prepare Cl_2 from HCl and HCl from Cl_2 ? Write the reactions.
 22. Mention the structures of a) XeF_2 and b) XeF_4
 23. Write the characteristic properties of transition elements.
 24. Explain Werner's theory of coordination compounds with suitable examples.
 25. Using IUPAC norms write the formulas for the following:
 - (i) Tetrahydroxozincate(II) ion
 - (ii) Hexaamminecobalt(III) sulphate
 - (iii) Potassium tetrachloropalladate(II) and
 - (iv) Potassium tri(oxalato)chromate(III)

26. Write the importance of carbohydrates.
27. With a suitable example write equations for the following:
- Reimer-Tiemann reaction.
 - Williamson's ether synthesis.
28. How will you carry out the following conversions?
- Ethane to bromoethane
 - Toluene to benzyl alcohol
29. Give one chemical test to distinguish between the following pairs of compounds.
- Methylamine and dimethylamine
 - Aniline and N-methylaniline
 - Ethylamine and aniline

SECTION - C

2 × 8 = 16

- Note:**
- Answer any **ANY TWO** questions.
 - Each question carries **EIGHT** marks.
 - All are long answer type questions.
30. (a) A solution of glucose in water is labeled as 10% w/w. What would be the molarity of the solution?
- (b) What is relative lowering of vapour pressure? How is it useful to determine the molar mass of a solute?
31. (a) Derive an integrated rate equation for a first order reaction.
- (b) Discuss the effect of catalyst on the kinetics of a chemical reaction with a suitable diagram.
32. How is ozone prepared from oxygen? Explain its reaction with
- a) C_2H_4 b) KI c) Hg d) PbS
33. Describe the following.
- Acetylation
 - Cannizzaro reaction
 - Cross aldol condensation
 - Decarboxylation