

CHEMISTRY

Time Allowed : 3 Hrs.

Max. Marks 60

Special Instructions :-

1. You must write question paper series in the circle at top left side of title page of your Answer-book.
 2. All questions are compulsory. Internal choices have been given in some questions.
 3. Question Nos. I to VI are multiple choice questions (MCQ) carry 1 (one) mark each. Choose one correct answer among four options.
 4. Question Nos VII to X are very short answer type carrying 1 (one) mark each. Answer these questions in about one word or one line.
 5. Question Nos. XI to XVII are short answer type carrying 2 (Two) marks each. Answer these questions in about 30 words each.
 6. Question Nos. XVIII to XXV are short type carrying 3 (three) marks each. Answer these questions in about 40 words each.
 7. Question Nos. XXVI to XXVIII are long type carrying 4 (four) marks each. Answer these questions in about 50 words each.
 8. Do not leave blank page / pages in your answer-book.
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- Q1. The coordination number of a metal crystallising in a hexagonal close packing structure is :
(a) 12 (b) 4 (c) 8 (d) 6 1
- Q2. The boiling point of solvent containing a non-volatile solute :-
(a) is decreased (b) is elevated
(c) does not change (d) None of the above 1
- Q3. Galvanised iron sheets are coated with :
(a) C (b) Cu (c) Zn (d) Ni 1
- Q4. The rate constant of a reaction is $1.2 \times 10^{-5} \text{ mol}^{-2} \text{ litre}^2 \text{ S}^{-1}$. The order of a reaction is :
(a) Zero (b) 1 (c) 2 (d) 3 1
- Q5. Which type of property is the Brownian movement of colloidal sol ?
(a) Electrical (b) Optical (c) Mechanical (d) Colligative 1
- Q6. Cinnabar is an ore of :-
(a) Hg (b) Zn (c) Ag (d) Cu 1
- Q7. Define inert pair effect. 1
- Q8. What is the shape of chromate ion ? 1
- Q9. Write the IUPAC name of iso - butyl alcohol. 1

- Q10. What happen when chloroform is exposed to air and sun light ? 1
- Q11. Write the four differences between Schottky defects and Frenkel defects. 2
- Q12. How many coulombs are required to deposit 50 gm of aluminium when the electrode reaction is :
 $\text{Al}^{3+} + 3\text{e}^{-} \longrightarrow \text{Al(S)}$ 2
- Q13. Write the mechanism of rusting of iron. 2
- Q14. Describe the following terms :
 (i) Electrolysis (ii) Emulsion 2
- Q15. (a) Give two examples of interhalogen compounds.
 (b) Oxygen exist as gas while sulphur exist as a solid at room temperature. Why? 1+1=2
- Q16. (a) Name the phenomenon responsible for the similar properties of Zr and Hf. Define it.
 (b) Why is the separation of lanthanoids difficult ? 1+1=2
- Q17. How is potassium dichromate prepared from chromite ? 2
- Q18. (a) Write the IUPAC system name of the complex compound :
 $\text{NH}_4 [\text{Cr} (\text{NH}_3)_2 (\text{NCS})_4]$ 1
 (b) Discuss the bonding in $[\text{Fe} (\text{CH})_6]^{3-}$. 2
- OR
- (a) Define coordination entity. 1
 (b) How many geometrical isomers of $[\text{Cr} (\text{en})_2 \text{Cl}_2]^+$ exist ? Which of these show optical activity ? 2
- Q19. (a) Why chlorobenzene is less reactive than chloroethane ? Explain. 2
 (b) How can you convert methyl chloride to ethyl chloride ? 1
- Q20. Write a note on the following :
 (a) Keimer - Tiemann Reaction
 (b) Coupling Reaction
 (c) Williamson's Synthesis 1+1+1=3
- Q21. (a) Define ppm. 1
 (b) A solution of glucose in water is labelled as 10% (w/w). The density of the solution is 1.20 gm L^{-1} . Calculate molality of solution. 2
- OR
- (a) Define Van't Hoff Factor 1
 (b) A solution containing 12.5 gm of a non-electrolyte substance in 175 gm of water gave boiling point elevation of 0.70 K. Calculate the molar mass of the substance.
 (K_b for water = $0.52 \text{ K Kg mol}^{-1}$) 2

- Q22. (a) Define activation energy. 1
 (b) A first order reaction is 20% complete in 10 minutes. Calculate the time for 75% completion of reaction. 2
- Q23. Explain the following :
 (a) PbQ_2 is more stable than PbCl_4 .
 (b) NH_3 has higher boiling point than PH_3 .
 (c) BF_3 is a weaker Lewis Acid than BCl_3 . 1+1+1=3
- Q24. (a) How can you distinguish between :
 aldehydes and ketones 1
 (b) Write a note on the following :-
 (i) H.V.Z. - Reaction
 (ii) Cannizzaco's Reaction 2
- Q25. (a) What type of bonds hold a DNA double helix together ? 1
 (b) What are proteins ? State their biological importance. 2
- Q26. (a) Give chemical reaction for Gabriel's phthalimide synthesis. 1
 (b) Explain, why ethyl amine is more basic than aniline. 2
 (c) How will you convert aniline to phenol. 1
- OR
- (a) Give chemical reaction for diazotization reaction and Hoffmann Bromide reaction.
 (b) What happen when :
 (i) Methyl isocyanide is treated with ozone.
 (ii) Methyl amine is treated with sodium nitrite and cold dil. HCl solution. 2+2
- Q27. (a) Write the monomers of Terylene. 1
 (b) Give the preparation of :
 (i) Buna - S
 (ii) Orlon 2
 (c) Define the Double Base Propellants. 1
- Q28. (a) Define Vat Dyes
 (b) Write a note on Zone refining.
 (c) Complete the following reaction :-
 (i) $\text{CH}_3\text{COCH}_3 + 4\text{HI} \xrightarrow[423 \text{ K}]{\text{Red P}} ? + ? + ?$
 (ii) $(\text{CH}_3)_2\text{CHOH} + \text{Cu} \xrightarrow{573 \text{ K}} ? + ?$ 2