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.

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 1.2×10^{-5} mol^{-2} litre^2 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

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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 :
$Al^{3+} + 3e^- \longrightarrow Al(S)$ 2

Q13. Write the mechanism of rusting of iron. 2

Q14. Describe the following terms :
(i) Electrodialysis (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 :
$NH_4 [Cr (NH_3)_2 (NCS)_4]$ 1
(b) Discuss the bonding in $[Fe (CH)_6]^{3-}$. 2
OR
(a) Define coordination entity. 1
(b) How many geometrical isomers of
$[Cr (en)_2 Cl_2]^+$ 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_6 for water = 0.52 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 wth 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) $CH_3COCH_3 + 4HI \xrightarrow[423\ K]{Red\ P}$? + ? + ?

         (ii) $(CH_3)_2\ CHOH + Cu \xrightarrow{573\ K}$? + ?   2

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CHEMISTRY
(New Regulation)
Practical

Time Allowed : 3 Hrs.   Max. Marks 25

Q1. Determine the equivalent weight of crystalline in a sample of Mohr's Salt, 19.6 gm of which have been dissolved per litre of the given solution. (Ask for what you want)

8

Q2. Find out two acidic radicals and two basic radicals from given mixture.   6

Q3. To prepare pure crystals of potash alum by crystallization method.   3

Q4. Class record and Viva.   4

Q5. Investigatory Project.   4

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