SS

2087

ANNUAL EXAMINATION SYSTEM

CHEMISTRY (Theory)

(Common for Science & Agriculture Groups)

(English Version)

(Evening Session)

Time allowed : Three hours

Maximum marks : 70

Note :   *(i)*   *You must write the subject code/paper code*   **053**   *in the box provided on the title page of your answer-book.*

    (ii)   *Make sure that the answer-book contains 30 pages (including title page) and are properly serialed as soon as you receive it.*

    (iii)   *Question/s attempted after leaving blank page/s in the answer-book would not be evaluated.*

    (iv)   *Log tables may be asked for if needed.*

    (v)   *Use of simple calculator is allowed.*

    (vi)   *Marks allotted to each question are indicated against it.*

    (vii)   *The paper comprises of 26 questions. Attempt total 26 questions. Internal choice is given in Q. No.* **19, 23, 24, 25** *and* **26.**

    (viii)   *Question No.* **1** *to* **8** *carry one mark each. Answer in one line.*

    (ix)   *Question No.* **9** *to* **16** *will be of two marks each. All questions are compulsory. They are short answer type questions.*

    (x)   *Question No.* **17** *to* **23** *will be of 4 marks each. All questions are compulsory. Internal choice is given for Q. No.* **19** *and* **23.**

    (xi)   *Question No.* **24, 25** *and* **26** *(Three questions) will be of 6 marks each. All questions are compulsory. Full internal choice is given.*

All questions are compulsory.

1.   Define molarity of a solution.   (1)

2. Define molecularity of a reaction. (1)

3. What type of drug is chloramphenicol ? (1)

4. What are antipyretics ? (1)

5. Mention one important function of nucleic acids in our body. (1)

6. Write down Clemmensen reduction reaction. (1)

7. Complete the following reaction :

   OH

   $+ C_6H_5COCl \xrightarrow{\text{Heat}}$ (1)

8. Convert aniline to bromobenzene. (1)

9. A compound is formed by two elements P and Q. Atoms of Q (as anions) make hcp lattice and those of the element P (as cations) occupy all tetrahedral voids. What is the formula of the compound ? (2)

10. The rate law for a reaction of A, B and C has been found to be rate $= k [A] [B] [C]^2$. How would the rate of reaction change when concentration of B is doubled ? (2)

11. Write down the names of any two ores of aluminium. (1+1=2)

12. Write down the name of monomers and anyone use of Nylon-6, 6. (2)

13. (i) Define co-ordination compound. (1)

    (ii) Write down IUPAC name of $[CrCl_2(H_2O)_4]NO_3$. (1)

14. Write down one main source and one deficiency disease of vitamin C. (1+1=2)

15. Why are aromatic amines weaker bases than aliphatic amines ? (2)

16. Write any two differences between Lanthanoids and Actinoids. (2)

17. An element having bcc geometry has atomic mass 50 amu. Calculate the density of the unit cell if its edge length is 290 pm. (4)

18. (i) State Raoult's law for binary solutions in which solute is non volatile. (2)

    (ii) Molal elevation constant for benzene is 2.52K Kgmol^{-1}. A solution of some organic substance in benzene boils at 0.126 K higher than benzene. What is the molality of the solution ? (2)

19. (i) Write any two differences between strong electrolytes and weak electrolytes. (2)

    (ii) Define molar conductivity. Write down its S.I. units. (1+1=2)

or

Write down the Nernst equation and calculate the emf of the following cell at 298K :— (4)

Fe(s) | Fe^{+2} (0.1M) || Ag$^+$ (0.1M) | Ag (s)

Given E$^\circ_{(Fe^{+2}|Fe)}$ = – 0.44 V

E$^\circ_{(Ag^+|Ag)}$ = 0.80V

20. Explain briefly the two types of emulsions. (2+2=4)

21. (i) How will ozone oxidise potassium nitrite ? (2)

    (ii) Why SF$_6$ is known but OF$_6$ is not known ? (2)

22. (i) Explain Victor Meyer's test for tertiary (3°) alcohols. (2)

    (ii) Phenols have higher boiling point than toluene. Explain. (2)

23. (i) Give one test to distinguish between acetic acid and acetone. (2)

    (ii) Write down the reaction between acetic acid and chlorine in presence of small amount of red phosphorus. (2)

or

    (i) Aldehydes are more reactive than ketones towards nucleophilic addition reactions. Explain. (2)

    (ii) How will you convert benzoyl chloride to benzaldehyde ? (2)

24. (i) H_3PO_2 is monoprotic acid. Explain. (2)

    (ii) SF_6 is known but SCl_3 is not known. Give reason. (2)

    (iii) Why group 18 elements are known as noble gases ? (2)

or

    (i) Draw flow chart for Haber's process in manufacture of ammonia. (3)

    (ii) Halogens have maximum negative electron gain enthalpy in their respective periods. Why? (2)

    (iii) Draw the structure of sulphuric acid (H_2SO_4). (1)

25. (i) Ions of Ti^{+4} are colourless while ions of Ni^{+2} are coloured. Why ? (2)

    (ii) The transition metals form coloured compounds. Explain. (2)

    (iii) Why do Zirconium (Zr) and Hafnium (Hf) exhibit similar properties ? (2)

or

    (i) Write down the reactions involved in the preparation of potassium dichromate from chromite ore. (3)

    (ii) Silver is a transition metal but Zinc is not. Why ? (2)

    (iii) Draw the structure of dichromate ion. (1)

26. Write down the following reactions

    (i) Hunsdiccker reaction (1)

    (ii) Finkelstein reaction (1)

    (iii) Wurtz Fittig reaction (1)

    (iv) Ullmann reaction (1)

    (v) Friedel Craft's alkylation (1)

    (vi) Halogenation of haloarenes (1)

or

    (i) Explain the mechanism of S_N2 reactions of alkyl halides. (3)

    (ii) Haloalkanes react with potassium cyanide (KCN) to give alkyl cyanide, but give alkyl isocyanide with silver cyanide (Ag CN) why ? (3)