

DSA – 260 (CHEM-UG) (F)

First Year B.Sc. Degree Examination, August/September 2008

Directorate of Correspondence Course

(Freshers)

Paper – 1 : CHEMISTRY

Time : 3 Hours

Max. Marks : 85

*Note : 1) This paper consists of four Sections. Answer all Sections.
2) Write equations and neat diagrams wherever necessary.*

SECTION – A

I. Answer in a word, a phrase or a sentence :

(10×1=10)

- 1) Define uncertainty principle.
- 2) How is a carbocation formed ?
- 3) What is zeta potential ?
- 4) Define calorific value.
- 5) What is a functional group ?
- 6) What is plasmolysis ?
- 7) Define hybridisation.
- 8) Define critical temperature.
- 9) What is a sigma bond ?
- 10) What is electron affinity ?

SECTION – B

II. Answer any FIVE of the following :

(5×3=15)

- 11) Define ionisation energy. Discuss its variation down the group and along the period.
- 12) Give the mechanism of SN² reaction.
- 13) Explain the degree of freedom of motion.

- 14) What are the constituents of paint ? Give their functions.
- 15) Describe the stability of cycloalkanes by Baeyer's strain theory.
- 16) Discuss diagonal relationship between Lithium and Magnesium.
- 17) Define Freundlich adsorption isotherm. Mention its limitations.

SECTION – C

III. Answer any FIVE of the following :

(5×6=30)

- 18) a) Compare the size of anion and cation with the size of atom. 3
 b) Explain the factors influencing ionisation energy. 3
- 19) a) Describe Carius method of estimation of halogen. 4
 b) How is butane prepared by Wurtz reaction ? 2
- 20) a) What is critical solution temperature ? Discuss critical solution temperature in Nicotine-water system. 4
 b) Calculate osmotic pressure of a 5% solution of glucose (mol wt = 180) at 18°C. 2
- 21) a) Describe the manufacture of water gas. 4
 b) What are propellants ? Give an example. 2
- 22) a) Give the mechanism of addition of HBr to propene in presence of a peroxide. 4
 b) $\text{CH}_3\text{CH}_2\text{Br} + ? \xrightarrow{\Delta} \text{CH}_2 = \text{CH}_2$
 Mention the reagent used above and name the reaction. 2
- 23) a) Calculate critical constants in terms of Vander waals constants using Vander waals equation. 4
 b) Vander waals constants for HCl gas are $a = 3.67 \text{ atm lit}^{-2}$ and $b = 40.8 \text{ ml mol}$, find the critical pressure of the gas. 2
- 24) a) What are the advantages of gaseous fuel over solid and liquid fuels ? 3
 b) What are ortho and para hydrogen ? Give any two differences between them. 3

