Q.P. Code – 50623

First Year B.Sc. Degree Examination, OCTOBER/NOVEMBER 2016

(Directorate of Distance Education)

Chemistry

(DSA 260) Paper I – CHEMISTRY – I

Time : 3 Hours] *[Max. Marks : 75/85*

Instructions to Candidates :

1) *This paper consists of five sections. Answer all sections.*
2) *Write equations and neat diagrams wherever necessary.*
3) *Section-**E** is **compulsory** for **85**-marks scheme only.*
4) *Section-**A** contains one mark questions and should be answered in first two pages of main answer book. The questions of Section-**A** answered in any other part will not be valued.*

SECTION – A

I. Answer in a word, a phrase or a sentence : **10 × 1 = 10**

1. State Heisenberg's uncertainty principle.
2. What are propellants?
3. Define Electron affinity.
4. State Nernst distribution law.
5. Define Glass.
6. What are cycloalkanes?
7. Write the IUPAC name of $CH_3 - CH_2 - \underset{\underset{CH_2}{\|}}{C} - \overset{\overset{CH_3}{|}}{C}H - CH_3$.
8. Define Gold number.
9. What are π-Bonds?
10. Define Ebullioscopic constants.

SECTION – B

II. Answer any FIVE Questions : **5 × 3 = 15**

11. State and explain, Hund's rule of maximum multiplicity with Nitrogen as example.

12. Define Hybridization. Explain the formation of Methane on the basis of hybridization.

13. What are isoelectronic ions? How does ionic radii varies?

14. Describe with mechanism addition of HBr to Ethyne.

15. What are the factors influencing the anamalous behaviour of Li?

16. Explain SN^1 reaction with mechanism.

17. What happens when HBr is added to propene in the presence of Benzoyl peroxide? Explain the mechanism.

SECTION – C

III. Answer any FIVE Questions : **5 × 6 = 30**

18. (a) What are Quantum numbers? Explain their significance.

    (b) Define Ortho and Para hydrogens. **4 + 2**

19. (a) Explain Sachse-Mohr theory of strainless rings.

    (b) Write any two reactions to show the acidity of alkynes. **3 + 3**

20. (a) How is charge on colloidal particles determined by Electrophoresis?

    (b) Organic compound containing 0.35 g of Nitrogen in Kjeldahl's experiment, liberated NH_3 which neutralized 11.5 ml of $1NH_2SO_4$. What is the percentage of nitrogen in organic compound? **4 + 2**

21. (a) Describe the Manufacture of Glass.

    (b) Discuss the desilverization of lead by Parke's process. **4 + 2**

22. (a) Discuss the stabilities of following chemical species.

    (i) Free radicals (ii) Carbocations.

    (b) Give the preparation of Cycloalkane by Freunds method. **4 + 2**

23. (a) Explain Homolytic fission with an example.

(b) How is alkane prepared by Wurtz Reaction?

(c) 0.44 g of substance dissolved in 22.2 g of benzene lowered freezing point of benzene by 0.567°C. Calculate the Molar mass of the substance.

(Given $K_f = 5.12°C\ mol^{-1}$) **2 + 2 + 2**

24. (a) Describe the determination of molecular mass of solute by Walker-Lumsden Method.

(b) Deduce the relation between relative lowering of vapour pressure and molar mass of a solution on the basis of Raoult's law. **3 + 3**

SECTION – D

IV. Answer any TWO Questions : **2 × 10 = 20**

25. (a) Derive an equation for critical constants.

(b) Explain the solubility curve of Phenol-Water system.

(c) What are Fuels? What are the advantages of gaseous fuels? **5 + 3 + 2**

26. (a) What are Paints? Explain constituents of Paints and their functions.

(b) Describe the diagonal relationship of Li and Mg.

(c) Define Electronegativity. **5 + 4 + 1**

27. (a) Give reason for the following :

(i) Alkali metals show an oxidation state of +1 only.

(ii) Degree of hydration of ions decreases from Li^+ to Cs^+.

(iii) Alkali metal compounds are ionic in general.

(iv) Alkali metals show different flame colouration.

(b) Describe the types of organic reactions with one example for each class. **4 + 6**

28. (a) Discuss any three factors which influence Ionization Energy.

(b) Write a note on Adsorption Indicator.

(c) Explain the method of production of water gas. Give its composition.

(d) State Aufbau's Principle. **3 + 3 + 3 + 1**

SECTION – E

V. Answer any ONE of the following questions : **1 × 10 = 10**

(**Compulsory** Question for **85** marks scheme only)

29. (a) How do you determine osmotic pressure of a solution by Berkley and Hartley's method?

(b) Discuss the classification of elements in to s, p, d, f blocks. **5 + 5**

30. (a) Explain the preparation of

(i) alkanes

(ii) alkenes

(iii) alkynes from alkyl halides

(b) What is meant by dual nature of an electron? Calculate the wavelength of the wave associated with a mass of 1.0 kg moving with a speed of 10 ms^{-1}. Given h = 6.63 × 10^{-34} Js. **6 + 4**

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