

Third Year B.Sc. Degree Examination
Aug/Sept 2009
Directorate of Distance Education Course

PAPER - III : CHEMISTRY

Time : 3 Hours

Max. Marks : 75

- Note :** 1) This paper consists of Four sections. Answer all sections.
2) Write equations & neat diagrams wherever necessary.

SECTION - A

- I. Answer the following questions in a word, a phrase or a sentence. 10x1=10
1. State second law of thermodynamics in terms of Entropy.
 2. State Kohlrausch's law.
 3. What is liquid junction potential?
 4. What is an isoelectric point?
 5. What are active centres?
 6. What is iodine value of oils?
 7. What are Abrasives?
 8. What is an Ellingham's diagram?
 9. What are alloys?
 10. What is meant by over voltage?

SECTION - B

- II. Answer any FIVE questions. 5x3=15
11. Explain the construction and working of Weston standard cell.
 12. Explain the variation of specific and molar conductance with dilution.
 13. How are refractories classified on the basis of chemical nature?
 14. Explain the influence of Nickel and chromium on the property of steel.
 15. Explain the carbobenzoxy method of synthesis of peptides.
 16. How Aldopentoses can be converted into aldohexoses.
 17. What are conductometric titrations? Mention their advantages.

SECTION - C

- III. Answer any FIVE questions. 5x6=30
18. a) Derive an expression for an entropy change during isothermal expansion of an ideal gas. 4
 - b) Calculate the amount of heat supplied to the Carnot's cycle working between 400K & 300K if maximum work obtained is 850J. 2

19. a) Explain the determination of P^H of a solution using Quinhydrone electrode. 4
 b) The equivalent conductances at infinite dilution for ammonium chloride, sodium hydroxide & sodium chloride are respectively 149×10^{-4} , 247×10^{-4} and $126 \times 10^{-4} \text{ Sm}^2 \text{ esvt}^{-1}$. Calculate the equivalent conductance of Ammonium hydroxide. 2
20. a) Explain the synthesis of vitamin C from D-Glucose. 4
 b) Explain briefly mutarotation of Glucose. 2
21. a) How is soap manufactured by Hot process? 4
 b) How do temp and P^H affect the activity of enzymes? 2
22. a) How is Gold extracted by hydrometallurgical process (cyanide process)?
 b) How is Gold refined by quartation process?
23. a) Compare the solvent properties of water and liquid ammonia w.r.t. Acid-Base neutralisation & solvolysis. 4
 b) What is meant by protonic and aprotic solvents? Give an example for each. 2
24. a) What are fuel cells? Explain the construction and working of H_2-O_2 fuel cells. 4
 b) Explain usefulness of carbon as a reducing agent based on the Ellingham diagram. ?

SECTION - D

- IV. Answer any TWO questions. 2x10=20
25. a) Elucidate the open chain structure of Fructose. 5
 b) Using the free energy function $G=H-TS$ show how free energy varies with change in pressure and volume. 5
26. a) Elucidate the structure of Nicotine. 5
 b) How is nickel extracted from sulphide ore? 5
27. a) How is transport number of Ag^+ ion determined by using platinum electrodes by Hittorof's method? 5
 b) Describe the electroplating of chromium. 5

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