

Third Year B.Sc. Degree Examination
August/September 2010

Directorate of Distance Education Course

(Freshers)

CHEMISTRY

Paper-III: Chemistry

Time: 3 hrs]

[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, phrase or a sentence :

10 X 1 = 10 Marks

1. What is a spontaneous process?
2. Write Van't Hoff's isotherms equation.
3. Define decomposition potential.
4. Give the relation between transport number and ionic conductance.
5. What is Zwitterion?
6. Define saponification value.
7. What is epimerization?
8. Define electroplating.
9. Write the equation for the formation of ionization of acetic acid in liquid ammonia.
10. What is the influence of carbon on the properties of steel?

SECTION - B

II. Answer any FIVE of the following :

5 X 3 = 15 Marks

11. What are Abrassives? How are they classified? Give example for each.
12. Explain the principles of electroplating.
13. What is the influence of silicon and cobalt on the properties of steel?
14. Define: i) Specific conductance ii) Equivalent conductance iii) Molar conductance
15. Define efficiency of heat engine. Calculate the efficiency of heat engine working between the temperatures 400K and 100K.
16. How do you convert glucose into fructose?
17. Explain the factors affecting the activity of enzymes.

SECTION - C

III. Answer any FIVE of the following :

5 X 6 = 30 Marks

18. a) Derive clausius-clapeyron equation. 6 Marks
19. a) Explain the determination of P^H of a solution using glass electrode. 4 Marks
- b) At 15°C the equivalent conductivity at infinite dilution of HCl and CH_3COONa are 380mhos and 80 mhos respectively. The transport number of H^+ ions and CH_3COO^- ions are 0.84 & 0.54 respectively. Calculate the equivalent conductance of acetic acid at infinite dilution. 2 Marks
20. a) What are terpenes? How are they classified? Give example each. 4 Marks
- b) Write note on isoprene rule. 2 Marks
21. a) What are amino acids? How are they classified? Give example for each. 4 Marks
- b) Explain isoelectric point. 2 Marks
22. a) Compare the solvent properties of water and liquid ammonia w.r.t. acid base neutralization and oxidation reduction reactions. 4 Marks
- b) Explain lattice energy. 2 Marks
23. a) How is manganese extracted from its oxide ore? 3 Marks
- b) Explain the recovery of silver from photographic plate. 3 Marks
24. a) Derive Gibb's Helmholtz equation. 4 Marks
- b) Calculate the entropy change during reversible and isothermal expansion of 1 mole of an ideal gas from 8dm^3 to 80dm^3 at 300k. 2 Marks

SECTION - D

IV. Answer any THREE of the following :

3 X 10 = 30 Marks

25. a) Elucidate the open chain structure of glucose. 5 Marks
- b) How is nicotine synthesise by Spaths's method? 3 Marks
- c) How are vitamins classified? 2 Marks
26. a) What is electrode potential? Derive Nernst equation for single electrode potential. 4 Marks
- b) What are potentiometric titrations? Explain the Hcl against NaoH titration. 4 Marks
- c) Explain the entropy change in reversible process. 2 Marks
27. a) How is Uranium extracted from pitch blende? 4 Marks
- b) What are refractories? How are they classified? Give example each. 3 Marks

- c) Explain the electroplating of gold. 3 Marks
28. a) With a neat labelled diagram explain the construction of calomel electrode and write the cell reactions. 4 Marks
- b) Write a note on cleaning action of soap. 3 Marks
- c) What are Ellingham diagrams? Explain the usefulness of carbon as a reducing agent based on the Ellingham diagrams. 3 Marks
