



**DSC – 260**

**Third Year B.Sc. Degree Examination, Sept./Oct. 2012**  
**Directorate of Distance Education**  
**CHEMISTRY (Paper – III)**

Time : 3 Hours

Max. Marks : 75/85

- Instructions:** 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.

**SECTION – A**

Answer the following questions in **a word, a phrase** or in **a sentence**. **(1×10=10)**

1. What is transport number ?
2. Define solvolysis.
3. What are alkaloids ?
4. Define specific conductance.
5. What are abrasives ?
6. State isoprene rule.
7. What is free energy ?
8. Define isoelectric point.
9. Give any two purposes of making alloys.
10. Define the term overvoltage.

**SECTION – B**

Answer **any FIVE** questions : **(5×3=15)**

11. Discuss the variation of specific conductance and molar conductance with dilution.
12. What are amino acids ? Explain phthalimide process for the synthesis of alanine.

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13. Explain the refining of gold by quartation process.
14. Describe the physical significances of entropy.
15. How do you prepare alloys by powder metallurgy method ?
16. Explain the conversion of D-glucose to vitamin C.
17. Explain the cleansing action of soaps.

## SECTION – C

Answer **any FIVE** of the following :

**(5×6=30)**

18. a) Explain the extraction of nickel from its ore.  
b) How are refractories classified ? **(4+2)**
19. a) Explain the formation of complexes in water and liquid ammonia solvents.  
b) Describe the electroplating of gold on copper plate. **(3+3)**
20. a) What are vitamins ? How are they classified ?  
b) Discuss the conversion of fructose into glucose. **(3+3)**
21. Derive an expression for total work done in a Carnot's heat engine. **6**
22. a) Discuss the factors affecting the enzyme activity.  
b) Name the product obtained when citral is heated with  $\text{KHSO}_4$  and what conclusions can be drawn from this reaction on the structure of citral ? **(4+2)**
23. a) Discuss the entropy change in reversible isothermal expansion.  
b) Calculate the entropy change involved in the isothermal reversible expansion of 1 mole of an ideal gas from a volume of  $1\text{ dm}^3$  to a volume of  $10\text{ dm}^3$  at  $27^\circ\text{C}$ . ( $R = 8.314\text{ JK}^{-1}\text{ mol}^{-1}$ ). **(3+3)**
24. a) Derive Gibbs-Helmholtz equation.  
b) The ionic conductance at infinite dilution of silver ions is  $61.92\text{ Ohm}^{-1}$  at  $25^\circ\text{C}$ . Calculate the ionic mobility of silver ions at  $25^\circ\text{C}$ . **(4+2)**



SECTION – D

Answer **any TWO** of the following :

**(2×10=20)**

25. a) Explain the extraction of uranium from pitchblende.  
b) How is silver recovered from photographic plates ?  
c) Describe the manufacture of carborundum. **(4+3+3)**
26. a) Write a note on mutarotation.  
b) Elucidate the structure of nicotine and confirm it by giving its synthesis. **(3+7)**
27. a) What are fuel cells ? Explain the construction and working of  $H_2 - O_2$  fuel cell.  
b) Explain the application of EMF in determining the valency of ions.  
c) What is liquid junction potential ? How is it minimized ? **(4+4+2)**

SECTION – E

Answer **any ONE** of the following :

28. a) Explain the carbobenzoxy method of synthesis of glycine alanine.  
b) What are oils and fats ? Explain the manufacture of soap by hot process ?  
c) How are proteins classified based on their shape ? Give one example for each class. **(4+4+2)**
29. a) Explain Debye-Huckel theory of strong electrolytes.  
b) What is Ellingham diagrams ? How does it explain the better reducing property of carbon in metallurgy.  
c) Derive Nernst's equation. **(4+4+2)**