

**Second Year B.Sc., Degree Examination****Directorate of Correspondence Course****Aug / Sept 2011****Chemistry****Paper - II**

Time : 3 hrs

Max. Marks : 75/85

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 x 10 = 10**

1. Name the type of bond formed between sodium and chloride ions.
2. Define the term "Accuracy".
3. Write the type of hybridization of carbon in methane molecule.
4. What is the nature of aqueous solution of sodium carbonate?
5. The process in which the temperature of the system is kept constant is called as,
6. What is meant by degree of polymerization?
7. Write the phase rule equation.
8. Write the IUPAC name of methyl alcohol.
9. What is hyper conjugation effect?
10. Name the type of Hydrogen bond in P - nitro phenol.

**SECTION - B***Answer any FIVE of the following:***5 x 3 = 15**

11. Explain the factors which favour the formation of ionic bond.
12. Explain the Mechanism of nucleophilic addition of HCN to carbonyl compounds.
13. What are parallel and consecutive reactions? Give one example each.
14. Explain why the density of ice is less than water.
15. Derive the relation between  $C_p$  and  $C_v$ .
16. Compare the acidities of Acetic acid and formic acid.
17. Describe the phase diagram of water system

Contd....2

**SECTION - C***Answer any FIVE of the following:*

5 x 6 = 30

18. a) Write the molecular orbital structure of oxygen molecule and give its Magnetic property and bond order?  
b) What are polar and non polar covalent bonds? Give one example each. 4 + 2
19. a) Derive Hendersons equation for an acidic buffer.  
b) Explain hydrolysis of a salt with example. 4 + 2
20. a) Explain Victor Meyer's method to distinguish between primary, secondary and tertiary alcohols.  
b) What is the action of sodium and nitrous acid on glycerol? 3 + 3
21. a) Write a note on  $n/p$  ratio.  
b) What are isotopes? Give one use of radioactive isotopes in studying reaction mechanism. 3 + 3
22. a) Derive an expression for maximum work done, in reversible isothermal expansion of an ideal gas.  
b) What are freezing mixtures? Give one example 4 + 2
23. a) Explain Mesomeric effect with an example.  
b) Give the synthesis of Aliphatic and Aromatic primary amines by the reduction of nitro compounds. 3 + 3
24. a) Derive the relation between  $K_h$ ,  $K_w$  and  $K_a$  for the salt of weak acid and a strong base.  
b) Explain Ostwald theory of acid - base indicators. 4 + 2

**SECTION - D***Answer any TWO of the following:*

2 x 10 = 20

25. a) Derive second order rate equation when  $a = b$ .  
b) Derive Kirchoff's equation.  
c) State Ostwald's dilution law. 4 + 4 + 2
26. a) Discuss the structure of diborane.  
b) Explain the shape and structure of Ammonia molecule using VSEPR theory.  
c) Write the flow diagram of Born - Haber cycle. 4 + 4 + 2

Contd.....3

27. a) How phenol is manufactured from Cumene.  
b) What is the effect of heat on  $\alpha$ ,  $\beta$ , &  $\gamma$  - hydroxy acids.  
c) Give any two uses of Grignord reagents.  
d) Write a note on cannizzaro's reaction 3 + 3 + 2 + 2

**SECTION - E**

*Answer any ONE of the following:*

1 x 10 = 10

28. a) (i) What are bonding and anti bonding molecular orbitals  
(ii) Explain SP hybridization with an example. 2 + 3  
b) (i) How Glycerol is manufactured by spent lye.  
(ii) Explain Induction effect with an example. 3 + 2
29. a) Explain the determination of molecular Mass of polymer by viscosity method.  
b) Explain the Band theory of solids. 5 + 5

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