

Second Year B.Sc. Degree Examination**August/September 2010**

Directorate of Correspondence Course

(Freshers)

CHEMISTRY**Paper-II: 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. Define polar covalent bond.
2. What is fullurens?
3. What are organometallic compounds?
4. State Gibb's rule.
5. What is mesomeric effect?
6. Define error.
7. What is the composition of cordite?
8. Define ionic strength.
9. Write the structure of cumene.
10. Mention an example for second order reaction.

SECTION - B**II. Answer any FIVE of the following :**

5 X 3 = 15 Marks

11. How order of reaction is determined by differential method.
12. Discuss SP hybridisation taking BeF_2 as an example.
13. Discuss the mechanism of esterification between acetic acid and ethyl alcohol.
14. Explain lindemann's hypothesis for unimolecular reaction.
15. Explain sp^2 hybridisation taking BF_3 as an example.
16. What is aldol condensation? Explain its mechanism.
17. Calculate the degree of hydrolysis in 0.012N solution of sodium acetate.
 $K_{\text{aCH}_3\text{COOH}} = 1.8 \times 10^{-5}$. Ionic product of water = 1×10^{-14}

SECTION - C

III. Answer any FIVE of the following :

5 X 6 = 30 Marks

18. a) How is lattice energy of NaCl crystals determined by Born Haber cycle? 4 Marks
 b) Explain intramolecular hydrogen bonding with an example. 2 Marks
19. a) Draw the labelled phase diagram of water system and discuss its salient features. 4 Marks
 b) Define: i) Accuracy ii) Precision 2 Marks
20. a) How do you synthesize the following from ethyl magnesium iodide?
 i) ethane ii) 2-butanol iii) Propanoic acid 3 Marks
 b) What is the action of Glycerol on :
 i) Oxalic acid at 503K ii) KHSO_4 and heat iii) Sodium 3 Marks
21. a) Explain why fluorine exists only - 1 oxidation state where as other halogens shows higher oxidation state. 3 Marks
 b) What are the essential features of freezing mixtures? 3 Marks
22. a) Discuss the stability of nucleus terms of n/p ratio. 3 Marks
 b) Discuss the action of nitrous acid in primary, secondary and tertiary amines. 3 Marks
23. a) Discuss the relationship between C_p and C_v . 3 Marks
 b) How is molecular weight of polymers can be determined by viscosity method. 3 Marks
24. a) Explain hyper conjugation effect with an example. 3 Marks
 b) Explain why acetone is less reactive than acetaldehyde. 3 Marks

SECTION - D

IV. Answer any THREE of the following :

3 X 10 = 30 Marks

25. a) Derive Kirchoff's equation showing the variation of heat of reaction with temperature. 4 Marks
 b) Discuss the structure and bonding in diborane. 4 Marks
 c) Silicon dioxide is a solid but CO_2 is gas. Explain. 2 Marks
26. a) Draw the molecular orbital diagram of O_2 molecule. 3 Marks
 b) How is acetyl chloride converted into propanoic acid? 3 Marks
 c) Which of the following is more acidic and why?
 Chloro acetic acid and acetic acid 2 Marks

27. a) Explain the geometry of water molecule on the basis of VSEPR theory. 4 Marks
b) How Tetraethyl lead is prepared? Mention the uses of TEL. 3 Marks
c) Corrolate the properties of diamond with its structure. 3 Marks
28. a) Explain the basicity of amines. 3 Marks
b) Explain the function of phenolphthalein as indicator by theory of indicators. 4 Marks
c) Calculate the ionic strength of
i) 0.25m K_2SO_4
ii) 0.5m $BaSO_4$ 3 Marks
