

**II Semester B.Sc. Examination, May/June 2010**  
**(Semester Scheme)**  
**CHEMISTRY – II**

Time : 3 Hours

Max. Marks : 60

*Instruction : Question paper has two Parts. Both the Parts should be answered.*

PART – A

Answer **any six** of the following questions. **Each** question carries **two** marks.

(6×2=12)

1. What is inter molecular hydrogen bonding ? Give an example.
2. Based on molecular orbital theory, write the electronic configuration of oxygen molecule.
3. Write the structure of xenon tetrafluoride. Mention the type of hybridisation involved.
4. What is the action of water on  $\text{BF}_3$  ?
5. Write the resonance structures of Anthracene.
6. What are boranes ? Give an example.
7. Write the structures of
  - i) 3-nitro benzoic acid
  - ii) 2-Iodo-4-methyl phenol
8. Mention any two applications of Nernst's distribution Law.
9. State Henry's Law of gas solubility.
10. Distinguish between open system and closed system.



## PART - B

Answer **any eight** of the following questions. **Each** question carries **six** marks.

(8×6=)

11. a) How is bleaching powder manufactured ?  
b) Name the type of hybridisation involved in SF<sub>6</sub> molecule. What is its shape ? (4)
12. a) Discuss the structure of BrF<sub>3</sub> based on VSEPR theory.  
b) Distinguish between sigma and pi bonds. (4)
13. a) What is Lattice energy ?  
Calculate the Lattice energy of NaCl from the following data.  
 $\Delta H_f = -410 \text{ kJmol}^{-1}$ ,  $\Delta H_s = 109 \text{ kJmol}^{-1}$   
 $\Delta H_E = -355 \text{ kJmol}^{-1}$ ,  $\frac{1}{2} \Delta H_D = 121 \text{ kJmol}^{-1}$   
 $\Delta H_I = 495 \text{ kJmol}^{-1}$   
b) Mention the properties of Ionic compounds. (4+)
14. a) Explain SP<sup>3</sup> hybridisation by taking SiCl<sub>4</sub> as an example.  
b) What is meant by Polarizability ? (4+)
15. a) How is Argon isolated from liquid Air ?  
b) What are Orthosilicates ? Give an example. (4+)
16. a) Discuss any two organic reactions that are carried out in liquid SO<sub>2</sub>.  
b) How does sulphuryl chloride react with ammonia ? (4+)
17. a) Explain the mechanism of Friedel Craft's alkylation of benzene.  
b) How is Naphthalene converted to phthalic acid ? (4+)

18. a) Explain the orienting influence of  $-OH$  group in Phenol.
- b) How is Toluene converted to benzaldehyde ? (4+2)
19. a) How are the following prepared ?
- i) Chlorobenzene from benzene
- ii) Bromoethane from Ethene.
- b) Illustrate Saytzeff's rule with an example. (4+2)
20. a) For a reversible adiabatic expansion of an ideal gas, show that  $pV^\gamma$  is a constant.
- b) What is thermodynamic equilibrium ? (4+2)
21. a) Derive Kirchoff's equation. (4+2)
- b) Calculate the work done required to compress 2 moles of oxygen isothermally and reversibly from a volume of  $10 \text{ dm}^3$  to  $5 \text{ dm}^3$  at 270 k. ( $R=8.314 \text{ JK}^{-1} \text{ mol}^{-1}$ ).
22. a) Draw the miscibility temperature-composition diagram of phenol-water system and explain the following terms.
- i) Critical solution temperature
- ii) Tie line
- b) What is an azeotropic mixture ? (4+2)
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