

1108  
B.E. (Biotechnology)  
Second Semester  
CH-202: General Chemistry

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

1. (a) Why furan is less aromatic than pyrrole?
- (b) What is diazotization?
- (c) How many spherical nodes are there in 3p orbital?
- (d) What is Diel-Alder's reaction?
- (e) What are meso compounds?

5x2 = 10

Part-A

2. (a) Derive the usual form of time independent Schrödinger wave equation 5
- (b) What are quantum numbers? Discuss their physical significance. 3
- (c) Give the physical significance of wave function. 2
3. (a) Draw molecular energy level diagram for NO and give its bond order. 3
- (c) What are main postulates of VSEPR theory? Discuss the shapes of XeF<sub>2</sub> and XeF<sub>4</sub> on the basis of VSEPR theory. 5
- (d) Explain why bond angle of NH<sub>3</sub> is greater than NF<sub>3</sub>? 2
4. (a) Give difference between diastereomers and enantiomers? 2
- (b) What is isomerism? Discuss its types with example. 5
- (c) Discuss the conformations of cyclohexane. 3

Part-B

5. (a) Why terminal alkynes are acidic in nature? 2
- (b) Discuss the mechanism of nitration of benzene. 4



- (c) Explain the following terms with example
- i) Dehydrohalogenation                      ii) Saytzeff's rule                      4
6. (a) Why  $\text{LiAlH}_4$  is stronger reducing agent than  $\text{NaBH}_4$  ?                      2
- (b) Discuss benzoin condensation with mechanism by giving suitable example.                      3
- (c) Compare the acidity of phenol and carboxylic acid.                      3
- (d) Give two synthetic utility of benzene diazonium salts ?                      2
7. (a) Describe Fischer-Indole synthesis and give its mechanism.                      4
- (b) How pyrrole and furan can be synthesized using Paal-Knorr synthesis?                      4
- (c) Why five membered heterocycles undergo electrophilic substitution reactions more readily than benzene?                      2