

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B. Pharm - SEMESTER– III• EXAMINATION – WINTER-2014**

**Subject Code: 2230004****Date: 24/12/2014****Subject Name: Pharmaceutical Chemistry IV (Organic Chemistry I)****Time: 10.30 am – 1.30 pm****Total Marks: 80****Instructions:**

1. Attempt any five questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- |             |     |  |           |
|-------------|-----|--|-----------|
| <b>Q.1</b>  | (a) | Enumerate various methods for quantitative estimation of nitrogen. Describe in detail about Dumas method.  | <b>06</b> |
|             | (b) | Explain in detail Molecular orbital theory.  | <b>05</b> |
|             | (c) | Write a note on bonding and anti-bonding orbitals.   | <b>05</b> |
| <b>Q.2</b>  | (a) | Correct if necessary and justify the following statements.<br>a) Nitrogen trifluoride has dipole moment less than ammonia.<br>b) Hyperconjugation is also called no-bond resonance.<br>c) Lower alcohols are insoluble in water.                       | <b>06</b> |
|             | (b) | Define hybridization and hybrid orbital. Explain in detail sp <sup>2</sup> hybridization of carbon.  | <b>05</b> |
|             | (c) | Describe the importance of resonance and hyperconjugation in stability and reactivity of molecules.  | <b>05</b> |
| <b>Q.3</b>  | (a) | Correct if necessary and justify the following statements.<br>a) Primary carbocation is more stable than tertiary carbocation.<br>b) Alcohols are having higher boiling point than ether.<br>c) Benzene undergoes electrophilic substitution reaction. | <b>06</b> |
|             | (b) | What are reactive intermediates of carbon? Describe in detail out carbocation.   | <b>05</b> |
|             | (c) | Differentiate between S <sub>N</sub> 1 and S <sub>N</sub> 2 reaction.  | <b>05</b> |
| <b>Q.4</b>  | (a) | How alcohols differ from phenol? Give detail mechanisms of aldol condensation.   | <b>06</b> |
|             | (b) | State Saytzeff's orientation and Markovnikov rules with examples.  | <b>05</b> |
|             | (c) | What are polynuclear aromatic compounds? Explain in detail Haworth synthesis for naphthalene.  | <b>05</b> |
| <b>Q.5</b>  | (a) | Correct if necessary and justify the following statements.<br>a) Cycloheptatrienyl cation is aromatic according to Hückle's rule.<br>b) Dehydration of tertiary alcohol is faster than primary alcohol.<br>c) Alkynes are more acidic than alkane.     | <b>06</b> |
|             | (b) | Explain detailed mechanism of dehydrohalogenation of alkyl halide.   | <b>05</b> |
|             | (c) | What is symmetrical and asymmetrical ether? Write a brief note Williamson's ether synthesis?   | <b>05</b> |
| <b>Q. 6</b> | (a) | Explain the two step mechanism of electrophilic aromatic substitution with its evidence.   | <b>06</b> |
|             | (b) | Explain the mechanism of halogenation for alkane.  | <b>05</b> |
|             | (c) | Define with examples, enantiomers, E & Z geometric isomers, conformation.  | <b>05</b> |
| <b>Q.7</b>  | (a) | Give importance of Grignard reagent in various reactions.  | <b>06</b> |
|             | (b) | Give types, preparation and reaction of dienes.  | <b>05</b> |
|             | (c) | Explain with examples hydrogen bonding and London force.   | <b>05</b> |