

B.Sc. I (CBCS)-Regular-Semester 2017 Sem I  
**USCHT02 - Chemistry Paper-II (Organic Chemistry)**

P. Pages : 2

Time : Three Hours



**GUG/S/18/10081**

Max. Marks : 50

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- Notes : 1. All the questions are, compulsory and carry equal marks.  
2. Write chemical reactions and draw diagram wherever necessary.

1. a) Define hybridisation. Explain structure of acetylene molecule on the basis of hybridisation. **5**
- b) Write short notes on. **5**
- i) Resonance effect.  
ii) Inductive effect.

**OR**

- c) Explain Homolytic fission and Heterolytic fission. **2½**
- d) What are carbocations? Give its method of formation. **2½**
- e) Write short notes on electrophile. **2½**
- f) Explain addition reaction with suitable example. **2½**
2. a) What is optical isomerism? Explain optical isomerism of tartaric acid. **5**
- b) Explain the term. **5**
- i) Asymmetric synthesis.  
ii) Walden Inversion.

**OR**

- c) Draw boat and chair conformation of cyclohexane. **2½**
- d) Explain geometrical isomerism of maleic acid and fumaric acid. **2½**
- e) State the sequence rule for R and S system of nomenclature. **2½**
- f) What is structural isomerism? Explain functional and position isomerism with example. **2½**
3. a) What are cycloalkanes? Give method of preparation of cycloalkanes by. **5**
- i) Freud's reaction.  
ii) Dieckmann reaction.
- b) What are diene? How they are classified? Explain Diels-Alder reaction. **5**

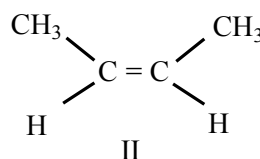
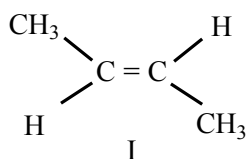
**OR**

- c) Explain free radical mechanism of halogenation of methane. 2½
- d) Explain dehydrohalogenation of Vicinal -dihalides. 2½
- e) Write short note on. 2½  
 i) Octane number and ii) Cetane number
- f) What is hydroboration? How will you convert ethylene to ethyl alcohol. 2½
4. a) What is electrophilic substitution reaction? Explain mechanism of nitration of benzene with energy profile diagram. 5
- b) What are activating and deactivating group? Describe influence of NO<sub>2</sub> group in nitrobenzene. 5

**OR**

- c) Describe molecular orbital structure of benzene. 2½
- d) Write short note on side chain halogenation of benzene. 2½
- e) State different condition of aromaticity. 2½
- f) Define ortho-para and meta directing group with suitable example. 2½
5. Attempt **any ten**. **1x10**  
**=10**

- i) Define bond energy.
- ii) Classify following as electrophile or nucleophile.  
 1) BF<sub>3</sub> 2) NH<sub>3</sub>
- iii) What is state of hybridisation in alkane.
- iv) What is chiral carbon atom?
- v) Identify E and Z form of following.



- vi) What is stereo isomerism?
- vii) Give IUPAC Name of  

$$\begin{array}{c}
 \text{CH}_3 \quad \text{CH}_3 \\
 | \quad | \\
 \text{CH}_3 - \text{CH} - \text{CH} - \text{CH}_3
 \end{array}$$
- viii) What is pyrolysis?
- ix) Write short note on L.P.G.
- x) What is action of acetyl chloride on benzene in presence of anhydrous AlCl<sub>3</sub>.
- xi) Identify ortho-para and meta directing group.  
 i) -NO<sub>2</sub> ii) -CH<sub>3</sub>
- xii) Write Huckel formula of aromaticity.

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