

M.Sc. (Chemistry) (NEP Pattern) Semester-I  
**NEP-12 / 01MSCCH02 - Organic Chemistry-I**

P. Pages : 2

Time : Three Hours



**GUG/W/24/15071**

Max. Marks : 80

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Note : All questions are compulsory and carry equal marks.

1. a) Explain aromaticity in benzenoid and non-benzenoid compounds with example. 8
- b) Explain: 8
- 1) Phase Transfer Catalysis.
- 2) Conjugation and cross conjugation in organic molecule.

**OR**

- c) Explain Crown ether complexes. 4
- d) Describe in short inclusion compounds. 4
- e) Explain synthetic application of enamines in organic synthesis. 4
- f) Explain in short antiaromaticity with example. 4
2. a) Explain Cahn-Ingold-Prelog system to describe configuration at chiral centers. 8
- b) Explain structure, stability of classical and non-classical carbocations. 8

**OR**

- c) Explain optical activity in biphenyl. 4
- d) Describe conformational analysis in monosubstituted cyclohexanes. 4
- e) Explain the following: 4
- 1) Elements of symmetry
- 2) Asymmetrical synthesis
- f) Explain generation and stability of carbenes. 4
3. a) Explain the Hamett equation and linear free energy relationship in a organic molecule. 8
- b) Explain neighboring group participation by  $\pi$  and  $\sigma$  bonds with example. 8

**OR**

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|-----------|---|----------|
| c)        | Explain Hammond's postulates.   | 4        |
| d)        | Explain kinetic and thermodynamic control.  | 4        |
| e)        | Explain classical and non classical carbocations.   | 4        |
| f)        | Explain intermolecular displacement involving oxygen atom.  | 4        |
| <b>4.</b> | a) Describe $SN^2$ reaction with its mechanism. What is the effect of leaving group on $SN^2$ reaction. | <b>8</b> |
|           | b) Explain the following:   | <b>8</b> |
|           | 1) Gattermann-Koch reaction   |          |
|           | 2) Smiles rearrangement reaction  |          |

**OR**

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|-----------|--|----------|
| c)        | Discuss Von-Richter reaction.                    | 4        |
| d)        | Explain Vilsmeier reaction.                      | 4        |
| e)        | Discuss in brief nucleophilicity.                | 4        |
| f)        | Explain Diazonium coupling reaction.             | 4        |
| <b>5.</b> | a) Explain Huckel's rule of aromaticity.         | <b>2</b> |
|           | b) Draw the structure of crown ether-18.         | <b>2</b> |
|           | c) Define threo and erythro isomers.             | <b>2</b> |
|           | d) Explain singlet oxygen.                       | <b>2</b> |
|           | e) Write Curtin-Hammett principle.               | <b>2</b> |
|           | f) Explain anchimeric assistance with example.   | <b>2</b> |
|           | g) Explain Pechman reaction (Reaction only).     | <b>2</b> |
|           | h) Explain Sommet-Hauser rearrangement reaction. | <b>2</b> |

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