

B.Sc. - III (CBCS Pattern) Semester-V  
**USCCHT09 - DSE Chemistry Paper-I - Organic Chemistry**

P. Pages : 2

Time : Three Hours



**GUG/S/25/13089**

Max. Marks : 50

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1. a) What do you understand by shielding and deshielding effect in the NMR spectra. 5  
b) Explain the principle of  $^1\text{H}$  NMR spectroscopy. 5

**OR**

- c) Suggest a structure with the following NMR data. 2½  
Molecular formula  $\text{C}_3\text{H}_6\text{O}_2$ .  
i) t, 1.25 $\delta$ (3H) ii) q, 2.1 $\delta$ (2H)  
iii) s, 10.5 $\delta$ (1H)  
d) Write short note on chemical shift. 2½  
e) Explain the term spin-spin splitting. 2½  
f) Give the nmr spectra of ethyl bromide. 2½
2. a) Give the synthesis of glycine & barbituric acid. 5  
b) Explain Claisen condensation with mechanism. 5

**OR**

- c) Define Keto-Enol tautomerism and apply it to ethyl acetoacetate. 2½  
d) How will you prepare Diethyl malonate from sodium chloroacetate. 2½  
e) Starting from diethyl Sodimalonate how will you prepare Dicarboxylic acid. 2½  
f) Explain Acidity of  $\alpha$  -hydrogen atom with suitable example. 2½
3. a) Write a short note on- 5  
i) Biodegradable polymer ii) Polymer additives  
b) Explain reaction of various aromatic pendent groups in polymers. 5

**OR**

- c) Give the synthesis of nylon 6.6. 2½  
d) Give the synthesis of Buna S-rubber. 2½

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|-----------|---|----------|
| e)        | Give the classification of di-block, triblock polymer.                        | 2½       |
| f)        | Write short note on conducting polymer with proper examples.                  | 2½       |
| <b>4.</b> | a) Write twelve principles of green chemistry.                                | <b>5</b> |
|           | b) Explain the concept of atom economy and its importance in green chemistry? | <b>5</b> |

**OR**

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|-----------|---|-----------|
| c)        | Write some organic toxic solvents and alternative green solvents. | 2½        |
| d)        | What do you mean by Cardle to Cardle.                             | 2½        |
| e)        | Write short note on catalysis in green chemistry.                 | 2½        |
| f)        | Write a note on sustainable development in green chemistry.       | 2½        |
| <b>5.</b> | Attempt <b>any ten</b> .  | <b>10</b> |
- a) What is the relation between  $\delta$  and  $\tau$ .
  - b) Write any two solvents used in NMR.
  - c) Give the number of signals in  $\text{CH}_3 - \text{O} - \text{CH}_3$ .
  - d) Give the structure of Acetoacetic ester.
  - e) Define active methylene compound.
  - f) What is ketonic hydrolysis?
  - g) What is PVC?
  - h) Draw the structure of caprolactam.
  - i) What type of polymerization process is used to produce urea-formaldehyde?
  - j) What is fed-stock in green chemistry?
  - k) Who is a father of green chemistry?
  - l) What is the environment benefits of green chemistry?

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