

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

P. Pages : 2

Time : Three Hours



GUG/W/24/13089

Max. Marks : 50

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1. a) Explain the principle of 'HNMR Spectroscopy'. 5
- b) Explain the following term. 5
- i) Coupling Constant ii) Peak Area.

OR

- c) How can you distinguish between equivalent and non-equivalent proton's in 'HNMR spectrum'. 2½
- d) An organic compound having molecular formula $C_9H_{10}O$ gives following 'HNMR data. 2½
- i) 3H-Singlet ($\delta_1 = 1.57$)
- ii) 2H-Singlet ($\delta = 3.07$)
- iii) 5H-Singlet ($\delta = 7.27$)
- Deduce the structure of organic compound.
- e) Explain Phenomenon of chemical shift. 2½
- f) Why the TMS is used as reference compound rather than other substances. 2½
2. a) Give the synthesis of diethyl malonate? Explain the synthesis of barbituric acid. 5
- b) Explain synthesis of acetoacetic ester by Claisen condensation with mechanism. 5

OR

- c) Explain Preparation of succinic acid using acetoacetic ester. 2½
- d) Explain Keto-Enol tautomerism. 2½
- e) Discuss the synthesis of Cinnamic acid from diethylmalonate. 2½
- f) How will you synthesize 4-Methyl Uracil from acetoacetic ester. 2½
3. a) Explain cross linking and hydrogenation reaction in polymer. 5
- b) Write short notes on: 5
- i) Biodegradable polymer ii) Polymer additives

OR

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| c) | Discuss classification of polymer including di and tri-blocks? | 2½ |
| d) | How will you prepare neoprene. | 2½ |
| e) | Write difference between thermoplastic and thermosetting polymer. | 2½ |
| f) | Discuss the reactions of aliphatic pendent group. | 2½ |
| 4. | a) Explain the concept of atom economy and its importance in green chemistry? | 5 |
| | b) What are twelve principles of green chemistry. | 5 |

OR

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| c) | How does green chemistry technology help in sustainable development? | 2½ |
| d) | What are green solvents and why are they important in green chemistry? | 2½ |
| e) | Describe one green method used in the synthesis of methyl-methacrylate? | 2½ |
| f) | Describe the role of catalyst in making. | 2½ |
| 5. | Attempt any ten. | 10 |
| a) | What is the relation between δ and τ values in NMR. | |
| b) | Which solvent is commonly used in ¹ H NMR ? | |
| c) | Give number of signals in $\text{CH}_3 - \overset{\overset{\text{O}}{\parallel}}{\text{C}} - \text{H}$ | |
| d) | Explain the term acidity of α - hydrogen. | |
| e) | Which functional group flanked between the active methylene compound. | |
| f) | What is Ketonic hydrolysis? | |
| g) | What is polymer? | |
| h) | What type of polymer is phenol formaldehyde? | |
| i) | What type of polymerization process is used to produce nylon 6,6. | |
| j) | What is the environmental benefits of green chemistry? | |
| k) | What are the two primary cycles in the cradle to cradle approach? | |
| l) | Who is the father of green chemistry? | |
