

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

P. Pages : 2

Time : Three Hours



**GUG/S/23/13089**

Max. Marks : 50

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1. a) Discuss principle of NMR spectroscopy. How many NMR peaks would you expect in 5  
i) Ethyl acetate  
ii) Acetone
- b) Write a note on. 5  
i) Chemical shift  
ii) Coupling constant (J)

**OR**

- c) Explain why TMS is used as reference compound in NMR spectroscopy. 2½
- d) What do you mean by equivalent and non - equivalent proton in NMR spectroscopy. 2½
- e) Explain Nuclear shielding & Deshielding. 2½
- f) An organic compound having molecular formula  $C_3H_6O$  shows following NMR data 2½  
i) 3H - triplet  $\delta - 1.5$   
ii) 2H - Quartet  $\delta - 2.6$   
iii) 1H - Singlet  $\delta - 9.6$   
Deduce the structure of compound.
2. a) What do you mean by active methylene compound? Give mechanism of Claisen condensation? 5
- b) Discuss synthesis of Glycine and barbituric acids from diethyl malonate. 5

**OR**

- c) Discuss Acidity of  $\alpha$ -hydrogen atom. 2½
- d) Discuss synthesis of 4 - methyl Uracil from acetoacetic ester. 2½
- e) Explain Keto - enol tautomerism. 2½
- f) Give one method of preparation of diethyl malonate. 2½
3. a) Discuss any two types of polymerization reactions in detail. 5
- b) Discuss natural and synthetic Rubbers with example. 5

**OR**

- c) What are polymers? Give its classification. 2½
- d) Discuss cross - linking polymerization reaction. 2½
- e) Explain Vulcanization of rubber. 2½
- f) Write a note on Conducting polymers. 2½
4. a) Discuss twelve principles of green chemistry in detail. 5
- b) Write a note on Green solvents and alternative methods in green chemistry. 5

**OR**

- c) Explain catalysis in green chemistry. 2½
- d) Explain sustainable development using concept of green chemistry. 2½
- e) Discuss the term cradle to cradle in green chemistry. 2½
- f) Explain atom economy in green chemistry. 2½
5. Solve **any ten**. 1x10
- a) How many NMR peak obtain in Toluene.
- b) Calculate  $\delta$  value for a compound if it has  $\tau$  value 7.5?
- c) Give any two solvents used in NMR.
- d) Write two examples of active methylene compounds.
- e) Structure of acetoacetic ester.
- f) What is the nature of  $\alpha$ -hydrogen in active methylene compounds.
- g) Define Amphiphilic polymers.
- h) Draw structure of Urea - formaldehyde resin.
- i) Give examples of Biodegradable polymers.
- j) Who is the father Green Chemistry?
- k) What is fed stock in green chemistry?
- l) Define solvent toxicity in green chemistry.

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