

2007-NATIONAL INSTITUTE OF TECHNOLOGY(NIT)

III SEMESTER B.TECH MID TERM EXAMINATION

ORGANIC CHEMISTRY
(CHEMICAL ENGINEERING)

TIME-1HOUR
MARKS-40

Note: Answer all questions. Each question carries 8 marks.

1. (a) Explain (i) Knoevenagel's reactions of ethyl cyanoacetate and (ii) keto-enol tautomerism in ethyl acetoacetate.
- (b). What do you mean by asymmetric synthesis ? Explain the rules governed in specifying R and S configurations to enantiomers with suitable examples.
2. (a) How is acetoacetic ester prepared in the laboratory ? Write the mechanism of the reaction. What is ketonic hydrolysis ?
- (b) Give reasons for the following:
- (i) The hydrogens on the methylene carbon are acidic in ethyl nitro acetate.
- (ii) The boiling point of keto form of ethyl acetoacetate is higher than that of enol form.
- (iii) The conformation in which methyl group occupying equatorial position is preferred in the structure of methyl cyclohexane.
3. (a) How are the following compounds prepared from diethyl malonate ?
- (i) 2-Methylbutanoic acid (ii) Hexanedioic acid.
- (b) Explain Reformatsky reaction with a suitable example. Give its mechanism.
- (c) Classify the following compounds as aromatic and nonaromatics. Justify your answer.
- (i) Cyclo octatetraene (ii) pyrrole
- (iii) cycloheptatrienyl cation. (iv) cyclopentadienyl cation.
4. (a) Write an account of (i) electrophilic additions (ii) nucleophilic addition reactions across carbon-carbon double bonds in acrolein. Give examples.
- (b) Give any two distinguishing properties of maleic acid and fumaric acid.
- (c) What are ketenes ? How is aceto acetic ester obtained from it?
5. (a) How is butyl lithium prepared ? Write its reaction with (i) acetaldehyde (ii) carbon dioxide (iii) pyridine.
- (b) How do you prepare (i) tetraethyl lead (ii) tetraethyl silane (iii) ethane and
- (iv) propanoic acid from ethyl magnesium iodide ?