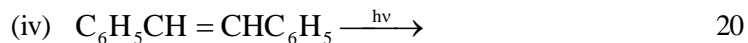
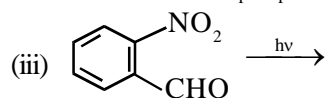
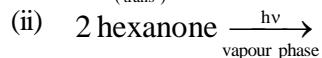
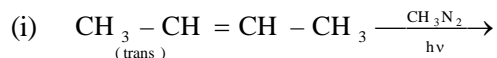
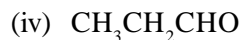
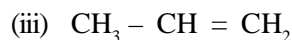
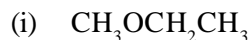


(c) Write the product of the following photoreactions. Explain their formation :



(d) Suggest the molecular formulae for the fragment ions obtained from isobutane m/e 43, 28, 27. 10

6. (a) How many NMR signals would be obtained in case of the following compounds ?



(b) How can IR spectroscopy be used to distinguish between intramolecular and intermolecular H-bonding ? 10

(c) What is meant by chemical shift ? Discuss the various factors on which the value of chemical shift depends. 10

(d) A compound with molecular formulae $\text{C}_{10}\text{H}_{22}\text{O}$ shows a strong absorption at 1705cm^{-1} in its IR spectrum and NMR spectra of the compound shows the following peaks :



Assign the structure of the compound with reason. 20

Roll No.

Total No. of Pages : 4

1(CCE.M)3

Chemistry-II

(05)

Time : Three Hours]

[Maximum Marks : 300

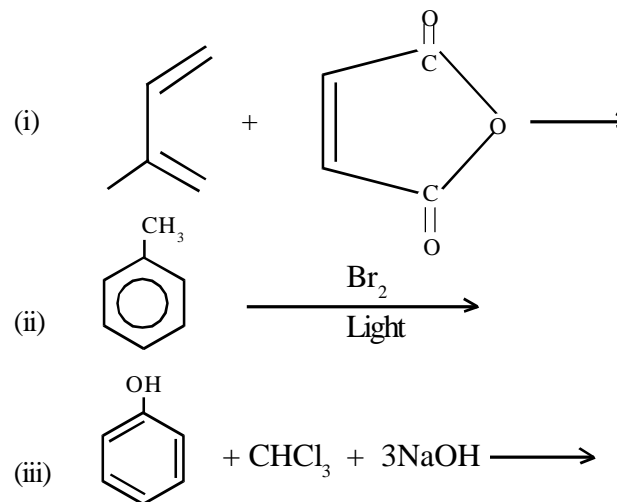
INSTRUCTIONS

- (i) Answers must be written in English.
- (ii) The number of marks carried by each question is indicated at the end of the question.
- (iii) The answer to each question or part thereof should begin on a fresh page.
- (iv) Your answer should be precise and coherent.
- (v) The part/parts of the same question must be answered together and should not be interposed between answers to other questions.
- (vi) Candidates should attempt any **five** questions.
- (vii) If you encounter any typographical error, please read it as it appears in the text-book.
- (viii) Candidates are in their own interest advised to go through the General Instructions on the back side of the title page of the Answer Script for strict adherence.
- (ix) No continuation sheets shall be provided to any candidate under any circumstances.
- (x) Candidates shall put a cross (x) on blank pages of Answer Script.
- (xi) No blank page be left in between answers to various questions.

- (xii) No programmable Calculator is allowed.
 (xiii) No stencil (with different markings) is allowed.

1. (a) What are carbocations ? How are they formed ? Explain the stability of carbocation. 15
- (b) Explain Michael addition with suitable example. 15
- (c) Give any two methods of formation of carbenes. Discuss the stability of carbenes. 15
- (d) What are nucleophilic substitution reactions ? Discuss the mechanism, stereochemistry and kinetics of S_N2 reactions. 15
2. (a) What are pericyclic reactions ? Discuss the Woodward-Hoffmann rules in the study of pericyclic reactions. 20
- (b) What is hydroboration of alkenes ? Explain the mechanism of hydroboration with suitable example. 20
- (c) Explain the mechanism of Friedel-Craft acylation of benzene. 10
- (d) Write the major product of nitration of aniline and nitrobenzene. Explain the directing effect observed. 10
3. (a) Explain the mechanism of any three of the following :
 - (i) Perkin reaction
 - (ii) Cannizzaro's reaction
 - (iii) Claisen condensation
 - (iv) Aldol condensation. 30
- (b) Write a note on :
 - (i) Viscosity of polymers
 - (ii) Silicones. 20

- (c) Give the method of preparation and uses of
 - (i) Polyvinyl chloride
 - (ii) Nylon - 6,6. 10
4. (a) Explain the mechanism of Reformatsky reaction with a suitable example. 15
- (b) Give the method of synthesis and structure of borazines. 10
- (c) Discuss the applications of uv spectroscopy. 10
- (d) Give one synthetic application for each of the following :
 - (i) Osmium tetroxide (O_5O_4)
 - (ii) Lithium aluminium hydride ($LiAlH_4$). 10
- (e) Write the structure of the product in the following reaction and give suitable explanation for their formation :



5. (a) Explain the importance of ESR in the study of inorganic complexes. 20
- (b) Explain the terms :
 - (i) Singlet state and
 - (ii) Triplet state. 10