

YMCA UNIVERSITY OF SCIENCE & TECHNOLOGY, FARIDABAD**M.Sc. (Chemistry) 1st SEMESTER (UNDER CBCS)****Organic Chemistry (General-I)(CH-102A)**

Time: 3 Hours

Max. Marks:60

- Note: 1. It is compulsory to answer the questions of Part -1. Limit your answers within 20-40 word in this part.
2. Answer any four questions from Part -2 in detail.
3. Different parts of the same question are to be attempted adjacent to each other.
4. Assume suitable standard data wherever required, if not given.

PART -1

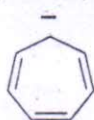
- Q1 (a) What are free radicals? What factors determine their stability? (2)
- (b) Briefly discuss the Hammond's Postulate. (2)
- (c) Draw energy profile diagram for two step reaction with first step endothermic and second step exothermic. (2)
- (d) Discuss the symmetry properties of HOMO of pentadienyl carbanion. (2)
- (e) What do you understand by non-classical carbocation? (2)
- (f) Why do enantiomers react differently in achiral environment? (2)
- (g) What do you understand by atropisomerism? (2)
- (h) Define the terms racemization and inversion of configuration. (2)
- (i) Draw all the possible stereoisomers of chlorocyclopropane. (2)
- (j) Explain the chirality of allenes giving suitable example. (2)

PART -2

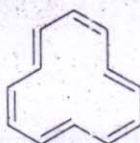
- Q2 (a) How the study of reaction intermediates can help in determination of reaction mechanism? Explain giving suitable example. (5)
- (b) Tell whether the following compounds are aromatic, nonaromatic, antiaromatic or homoaromatic. (5)



(i)



(ii)

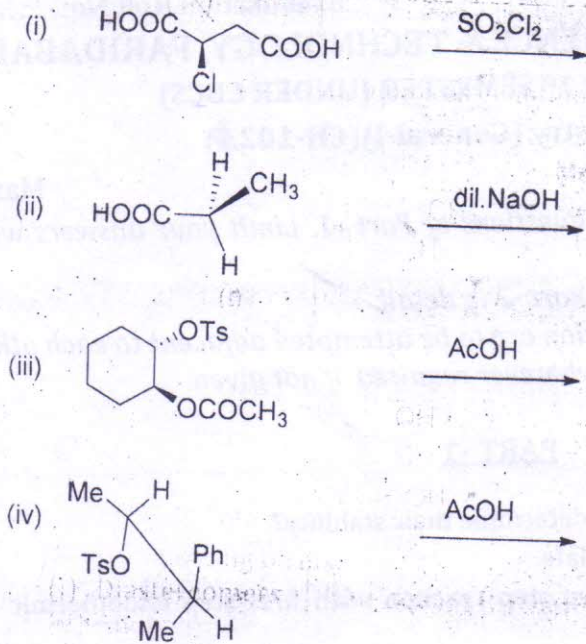


(iii)

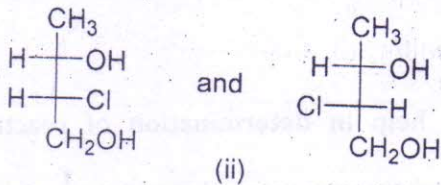
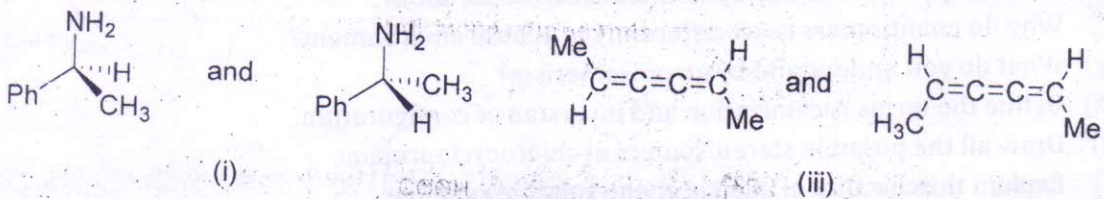


(iv)

- Q3 (a) Considering the example of sulphonation of naphthalene, explain kinetically and thermodynamically controlled products. (3)
- (b) Write down the Hammett equation. Briefly explain its role. (3)
- (c) What do you understand by isotope labeling and isotope effect in organic reaction mechanism. (4)
- Q4 (a) Complete the following reactions giving plausible mechanism; (10)



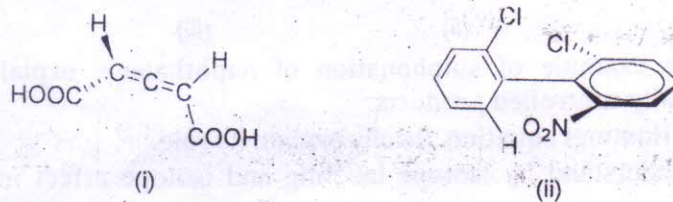
Q5 (a) Indicate the following compounds as enantiomers/diastereomers/identical/none. (6)



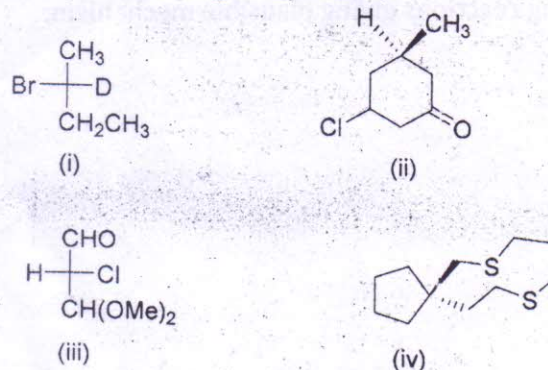
(b) Define the following terms: (4)

(i) Diastereomers
 (ii) Anomers
 (iii) Chirality
 (iv) Chiral axis

Q6 (a) Assign R/S designation to the following compounds; (4)



(b) Assign R/S designation to the following compounds; (6)



- (a) What do you understand by topicity? How topicity of two atoms in a molecule related to the symmetry elements? (4)
- (b) Draw structures of (2S,3S)-3-Chlorobutan-2-ol. (2)
- (c) Draw all possible conformers of trans-2-decalol and give their relative stabilities. (4)
