

M.SC. CHEMISTRY
Second Semester
Organic Chemistry-II

(MSC-06)

Duration: 3Hrs.

Full Marks: 70

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

1. Answer the following questions: (any two)

(1+2)×2=6

- a) What are the essential conditions of Chirality for compounds having chiral axes. Explain with suitable example in support of your answer.
- b) What do you mean by atropisomerism? What direct chemical proof you can provide to show that optically active biphenyls have non-planar configuration.
- c) What do you mean by pro-chiral molecule? How many pro-chiral centres are present in citric acid molecule?

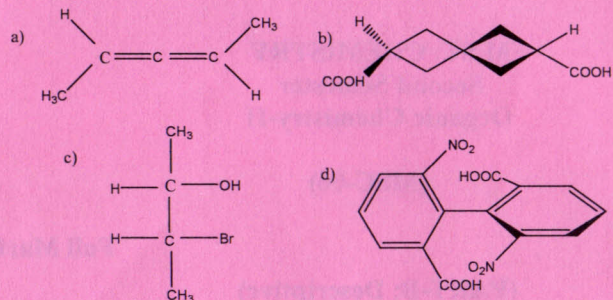
2. Define Cram's rule and with the help of this rule predict the major product from the reaction of α -phenyl propionaldehyde with methyl magnesium bromide. 3+2=5

Or

With the help of Prelog's rule, how can you predict the configuration of an optically active alcohol? 5

3. Assign R/S nomenclature to the following compounds (any two)

2×3=6



4. Answer the following questions:

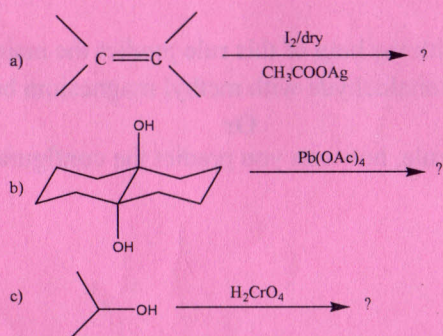
- a) What is Fischer Indole Synthesis? How can you synthesise 3-methyl indole by this process? 3
- b) Pyridine does not undergo Friedel Crafts alkylation or acylation. Explain 2
- c) How will you synthesise 2-methyl quinoline from aniline? 2
- d) What are azoles? Give the methods of preparation of any two azoles. 1+2=3
- e) Explain why thiazole is resistant to electrophilic substitution reaction? 3

5. i) Write short notes on: (any two)

2½×2=5

- a) Collins Reagent
- b) PCC
- c) Swern Oxidation

ii) Complete the following reactions with appropriate mechanisms (any two) 2½×2=5



6. Answer the following questions (any two).

2×5=10

- (a) What is Birch reduction? Explain with mechanism. What type of products will form if the compound contains an electron withdrawing group?
- (b) What are the advantages of using sodium borohydride over lithium aluminium hydride? Explain with suitable example.
- c) Write down one preparation of 9-BBN. Explain its selectivity in brief.

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(The figures in the margin indicate full marks for the questions)

Duration: 20 minutes

Marks – 20

(PART A- Objective)

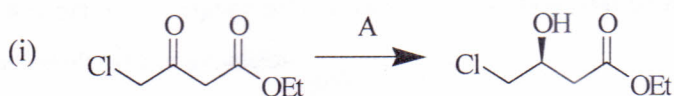
I. Choose the correct answer: 1×15=15

1. Isomeric structures of a molecule obtained by rotation about a single bond are called
a) optical isomer b) conformational isomer
c) geometrical isomers d) positional isomer.
2. Dihedral angle between the two methyl groups in the least stable staggered conformation of n-butane is
a) 0° b) 60° c) 120° d) 180°
3. The energy difference between the axial and equatorial conformers of methyl cyclohexane is
a) 75KJ/mol b) 7.5 KJ/mol
c) 0.75KJ/mol d) none of these.
4. Most stable isomer of 1,4-dimethyl cyclohexane is
a) cis (ae) b) trans (ea)
c) cis (ea) d) trans (ee)
5. Number of Pro-chiral centre(s) in 3-chloro propionic acid molecule is/are
a) 3 b) 4 c) 1 d) 2
6. The rule which co-relates the configurations of an optically active alcohol with those of α -hydroxy acids is called
a) anti-Markovnikove's rule b) Prelog's rule
c) Cram's rule d) Saytzeff rule

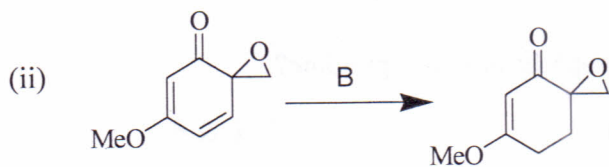
7. Which of the following positions are favorable for Nucleophilic attack in pyridine?
 a) 3 & 5 b) 1 & 3 c) 1 & 5 d) 2, 4, & 6
8. Skraup Synthesis is used to synthesise
 a) pyridine b) Indole c) Quinoline d) Isoquinoline
9. The starting material of Bischler-Napieralski reaction is
 a) β -phenylenediamine, b) β -phenylethylamide c) β -phenylethylamine d) none of these
10. Indoxyl is
 a) 2-hydroxy indole b) 3-hydroxy indole c) 4-hydroxy indole d) none of these
11. Atropisomerism is exhibited by
 a) allene b) spirans c) biphenyls d) none of these
12. Alcohols with a hydrogen in the δ -position can be cyclised to tetrahydrofuran by
 a) $\text{Pb}(\text{OAc})_4$ b) HIO_4 c) $\text{Hg}(\text{OAc})_2$ d) DCC
- 13 Conversion of an olefin into cis-1,2 diol by iodine and silver acetate in hydrated media is called
 a) Prevost reaction b) Woodward reaction c) Swern Oxidation d) None of these
14. Treatment of acetone with SeO_2 gives
 a) propionic acid b) Glyoxal c) Methyl glyoxal d) Propane
15. Swern oxidation is carried out in
 a) Neutral media b) basic media c) acidic media d) both b) & c)

II. Write down the proper reagents and products for A, B, C, D and E.

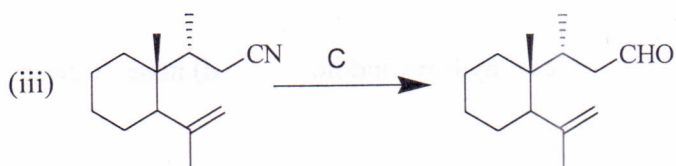
1×5=5



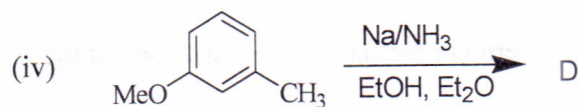
Ans:



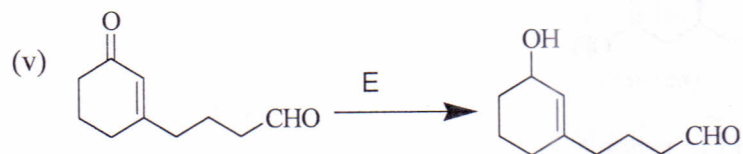
Ans:



Ans:



Ans:



Ans:
