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Total No. of Pages : 03

Total No. of Questions : 09

M.Sc. (Chemistry) (2015 to 2017) (Sem.-1)

ORGANIC CHEMISTRY

Subject Code : MSCH-102

Paper ID : [A2706]

Time : 3 Hrs. Max. Marks : 100

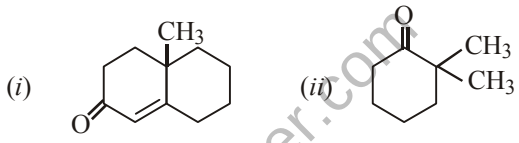
INSTRUCTION TO CANDIDATES :

1. Attempt FIVE questions in all.
2. Attempt ONE question each from Section A, B, C and D.
3. Section E is COMPULSORY. All questions carries equal marks.

SECTION-A

1. a) Describe the rules of disconnection in organic synthesis giving suitable examples.

   b) Describe the synthesis of following compounds with proper retro-synthetic analyses : (8+12)



2. a) What is Umploung synthesis? Describe the synthesis of umpoled synthons and synthetic equivalents.

   b) How will you prepare the following using Claisen ester condensation reaction?

      i) Cyclopentan-l,3,5-trione.

      ii) 2-Methylcyclohexanone.

   c) Explain the following giving suitable examples :

      i) Convergent synthesis.

      ii) Protection of functional groups. (6+8+6)

SECTION-B

3. a) Describe the applications of lithium dialkylcuperates in organic synthesis.

   b) Describe the use of Lithium diisoropylamide (LDA) in organic functional group transformations.

   c) What are Phase transfer catalysts? Give applications of Phase transfer catalysts. (6+7+7)

4. a) What is Merrifield resin? Explain the applications of Merrifield resin in organic synthesis.
   b) Describe the applications the following in organic synthesis :
      i) Baker Yeast
      ii) Crown ethers
      iii) Mg compounds (5+5+5+5)

SECTION-C

5. a) What is Enantiomeric Excess (ee)? Which among the GC, HPLC and NMR is most suitable method in determination of enantiomeric excess (ee) and why? Explain giving suitable examples.
   b) Explain the following :
      i) Kinetic & optical resolution.
      ii) Enantio-discrimination. (8+6+6)
6. a) Describe methods of asymmetric induction in reagent controlled reactions giving suitable examples.
   b) Explain the following :
      i) Asymmetric acyl transfer reactions.
      ii) Chiral quaternary ammonium salts. (6+7+7)

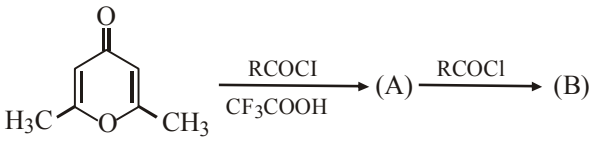
SECTION-D

7. a) Describe the chemical properties of anthracene.
   b) How will you prepare aziridnes from the following methods?
      i) The Gabriel ring closure.
      ii) Hoch-Campbell method.
   c) Explain the following :
      i) Reactions of oxirane with organo-metallic compounds.
      ii) Thermal and photochemical reactions of oxirane. (5+5+5+5)
8. a) Describe the following methods for the synthesis of furan :
      i) From carbohydrates.
      ii) Paal-Knorr synthesis.
   b) Describe the chemical properties of pyrrole.
   c) Explain the following :
      i) Electrophilic substitution reactions of Thiophene.
      ii) Synthesis of pyrylium salts. (5+5+5+5)

SECTION-E

9. a) Why are 2-azirine, oxirene and thiirane called as anti-aromatic? Explain.

b) What will be (A) and (B) in the following reaction?

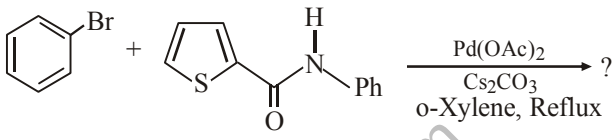


c) Which of the following will be hydrolyzed more easily and why?

i) β-lactam

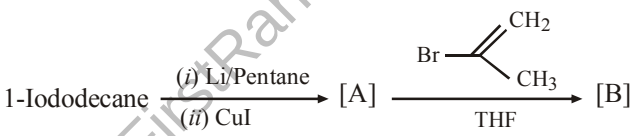
ii) An acyclic amide.

d) Complete the following :

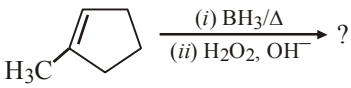


e) Mention TWO criteria for a good de-protecting group.

f) What is (A) and (B) in the following reaction :



g) Complete the following :



h) Give ONE application of Wilkinson's catalyst.

i) What are coumarins? Give their ONE important application.

j) Complete the following :