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S-2602

M. Sc. (Part - I) (Sem. I) Examination

March / April – 2011

Organic Chemistry : Paper - II

Time : **3** Hours] [Total Marks : **70**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **M. Sc. (PART - 1) (SEM. 1)**

Name of the Subject :

☛ **ORGANIC CHEMISTRY - 2**

☛ Subject Code No. : **2 6 0 2** ☛ Section No. (1, 2,.....) : **NIL**

Seat No. :

Student's Signature

(2) Figures to the **right** indicate full marks of the questions.

1 Answer any **three** of the following : **18**

(a) Explain briefly dynamic stereochemistry.

(b) What is resolution? Give any four methods for resolution of racemates.

(c) What is conformation? Explain relative stabilities of conformers of bicyclo[4,4,0] decane.

(d) Give the conformers of ethane. Explain relative stabilities of conformers of perhydrophenanthrins.

2 Answer any **three** of the following : **18**

(a) What are classical and non classical carbocations? Explain how solvolysis of tosylate of-L-threo-3-phenyl-2-butanol gives a racemic mixture of 96% of threo acetates.

(b) (i) Discuss the various factors affecting the stability of carbanions.

(ii) Explain the role of carbanion in the synthesis of :

- Ethyl cinnamic acid
- Diacetone alcohol

Give the name of the reactions used for synthesis.

(c) (i) What are free radicals? Give different methods of generation of short-lived and long-lived free radicals.

(ii) Give the mechanism of the following :

- Sandmeyer reaction
- Allylic bromination

(d) (i) What are carbenes? Give the methods of formation of triplet carbene. Give the insertion reaction of carbene.

(ii) Explain the mechanism of the following :

– Arndt-Eistert synthesis

– Bamford Steven's rearrangement

3 Answer any **three** of the following : **18**

(a) Construct the correlation diagram for the conrotatory and disrotatory ring closure of trans, cis, trans-2,4,6-octatriene and comment on the allowedness of the reaction.

(b) What is PMO method? Using PMO method discuss selection rules for cycloreversions and sigmatropic rearrangement.

(c) Derive the selection rules for 4q π and (4q+2) π electron system with the help of FMO method for cycloaddition reaction.

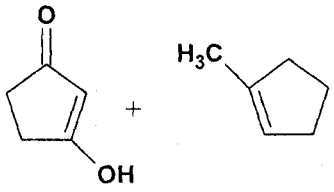
(d) Write a note on sigmatropic rearrangement.

4 Answer any **four** of the following : **16**

(a) Complete the following reactions with structural formula :

(i) Butadiene + cis & trans Dimethyl-2-Butenedioate $\longrightarrow$? + ?

(ii) Benzene + 1,2-Dichloro ethene $\xrightarrow{h\nu}$?

(iii) 

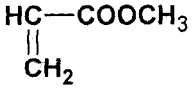
$\xrightarrow{h\nu}$? + ?

(iv) Ethyne + Diazomethane $\longrightarrow$?

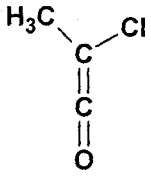
(b) Draw the axial and equatorial bonds in cyclohexane. Explain the different conformations in mono substituted cyclohexane and discuss the stability.

(c) Complete the following reactions with structural formula:

(i) Styrene + Diazomethane $\xrightarrow{80\ ^\circ C}$?

(ii) cis & trans 1,3-Pentadiene + 

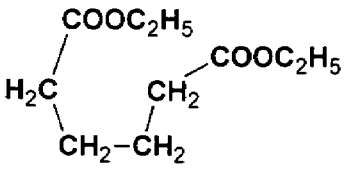
$\longrightarrow$? + ?

(iii)  +  ⟶ ? + ?

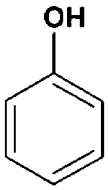
(iv) cis & trans 2-Butene + O_3 ⟶ ? + ?

(d) Discuss the mechanism of the following rearrangements in which carbocation play a key role:
- Pinacol-Pinacolone rearrangement
- Dienone-Phenol rearrangement

(e) Discuss the mechanism of the following reactions in which reactive intermediate play a key role:



Dieckmann reaction ⟶



Reimer - Tiemann rearrangement ⟶
