Total No. of Questions : 6]

SEAT No : ____

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[5323]-312

M.Sc. - II

ORGANIC CHEMISTRY

CHO-352 : ORGANIC STEREOCHEMISTRY

(2014 Pattern) (Semester - III) (New) (4 Credits)

Time : 3 Hours] ***[Max. Marks : 50***

Instructions to the candidates:

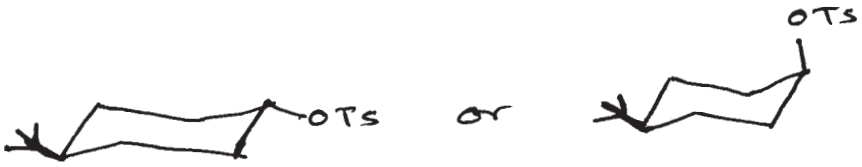
1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Answers to the two sections should be written in separate answer book.***

SECTION - I

Q1) Answer the following : **[10]**

a) Cyclopropanone and cyclobutanone prefers to undergo addition reaction than substitution reaction. Explain

b) Which of the following isomer gets solvolysed Faster and why.



c) Give two methods of preparation of compounds with bridged ring systems.

d) What is the difference between uv spectra at paracyclophanes when n = m= 2 and when n = m = 6 and why ?

e) Why β - benzene hexachloride reacts more slowly by several powers of 10 than any of its isomers?

Q2) Attempt any two of the following : **[10]**

a) Draw all possible conformations of cis and Trans1-Phenyl-2-Aminocyclohexanol and comment on their stability giving reasons.

P.T.O.

b) Explain giving reason the orientation of hydroxyl group during reduction of cyclohexanone by

i) Catalytic hydrogenation

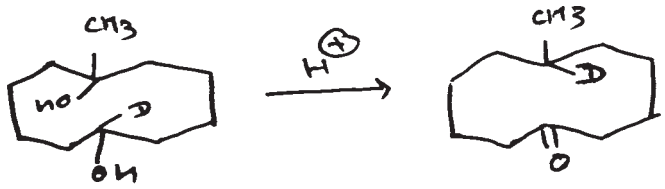
ii) MPV reduction

iii) Reduction with metal hydride.

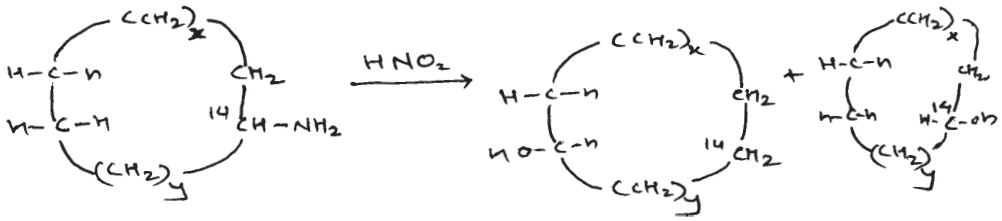
c) Write the stable conformation at trans-anti-trans and trans - syn - trans perhydroanthracene. Calculate their energies and comment on their optical activity.

d) Explain the product formation giving mechanism in following reactions. Justify your answer.

i)



ii)



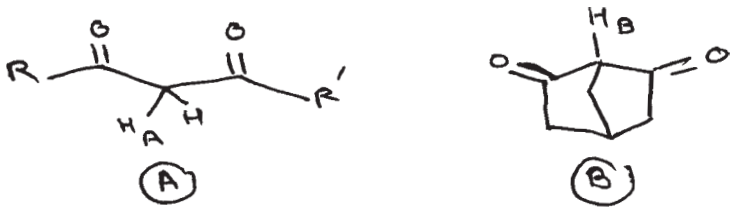
Q3) Answer the following (Any one) **[5]**

a) Write short note on

i) 3 - alkyl ketone effect

ii) Enolization in cyclohexanone

b) i) Why H_A in Compound A can undergo tautomerism and H_B in compound B can not.



ii) Explain the concept of bond opposition strain with suitable example.

SECTION - II

Q4) Answer Any Three of the following : **[09]**

a) Describe the method of resolution via molecular complexes.

b) Cis, 1,2 dichloro, Cis 1,2 dibromo Ethylene have dipole moments of 1.89, and 1.35 D respectively whereas the trans isomers are zero. Explain

c) Describe the method of resolution via biochemical transformation with suitable examples.

d) Explain, how Cis and trans isomers of trisubtituted ethylenes of the $CH_3aC = CH_b$ differentiate by using N.M.R spectroscopy study.

Q5) Answer Any Four of the following **[08]**

a) Explain the stereochemistry of addition reaction of Olefins.

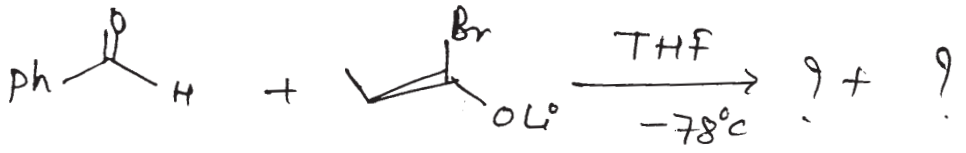
b) Describe enantiomeric excess with suitable examples.

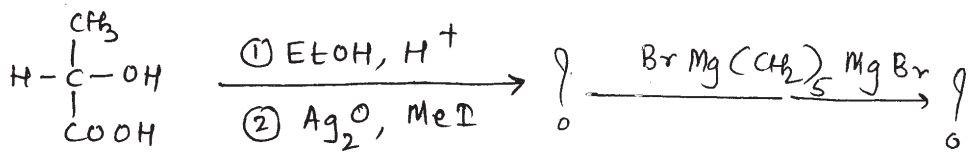
c) Explain use of chiral solvating agents.

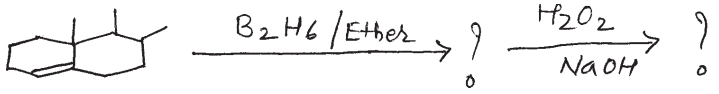
d) Describe the methods of determination of relative configuration of diastereomers.

e) Malic acid on treatment with PCl_5 gives (+) chlorosuccinic acid while on treatment with $SOCl_2$ gives (-) chlorosuccinic acid. Explain.

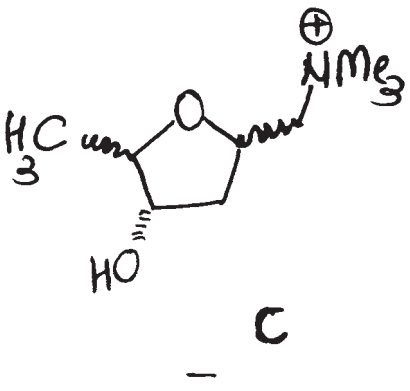
Q6) a) Predict the product/s in Any Two of the following and explain stereochemical principles involved. Justify. **[04]**

i) 

ii) 

iii) 

b) Draw the correct stereostructure of a compound C with the help of ^{1}H-NMR data given below and justify your assignment. **[04]**



C

^{1}H-NMR (δ, ppm)

1.16 (d, J = 6.5Hz, 3H): 1.86 (ddd), J = 12.5, 9.5, 5.5 1H); 2.02 (ddd, J = 12.5, 2.0, 6Hz 1H); 3.36 (S, 9H) 3.54 (dd, J = 13, 9 1H); 3.74 (dd, J = 13,10 Hz, 1H); 3.92 (dq J = 2.5, 6.5, 1H); 4.03 (m, 1H); 4.30 (1 H d J = 3.5exch. D_2O); 4.68 (m, 1H)

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