

This question paper contains 4+2 printed pages]

AI—137—2017

FACULTY OF SCIENCE

M.Sc. (First Year) (Second Semester) EXAMINATION

MARCH/APRIL, 2017

CHEMISTRY

Paper II (CH-422)

(Organic Chemistry)

(Monday, 24-4-2017)

Time : 10.00 a.m. to 1.00 p.m.

Time— Three Hours

Maximum Marks—75

N.B. :— (i) Attempt All questions.

(ii) Figures to the right indicate full marks.

(iii) Use of Logarithmic table and calculator is allowed.

(iv) Multiple choice questions (MCQs) should be attempted only once on page no. 3 of answer-book with complete answer.

1. Attempt any *three* of the following : 15

(a) What are sigmatropic rearrangement ? Explain 1, 5-sigmatropic rearrangement by FMO and PMO method.

(b) What do you understand the terms Regioselectivity and Chemoselectivity ? Explain with examples.

(c) Explain the stereoselective and stereospecific reactions with example.

(d) What is the action of LiAlH_4 on carbonyl compounds ? Explain with mechanism and compare this reaction with cinnamaldehyde and LiAlH_4 .

(e) What is conformational analysis ? Explain the conformational analysis of 1, 3 dimethyl cyclohexane.

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2. Answer any *three* of the following : 15

- What is Sharpless Asymmetric Epoxidation? Give its mechanism and application.
- Explain the interconversion of cyclobutene $\xrightarrow{\Delta/h\nu}$ 1,3 Butadiene under thermal and photochemical condition by co-relation diagram method.
- Explain the orientation of double bond in Elimination reaction with the help of Saytzeff rule and Hofmann rule.
- Explain the stereochemistry of Allenes and Spiranes.
- What are cycloaddition reactions? Explain the cycloaddition between the two molecules of ethylene. ($2\pi + 2\pi$) system.

3. (a) Explain the 1,3-dipolar cycloaddition reaction and chelotropic reactions with mechanism. 7

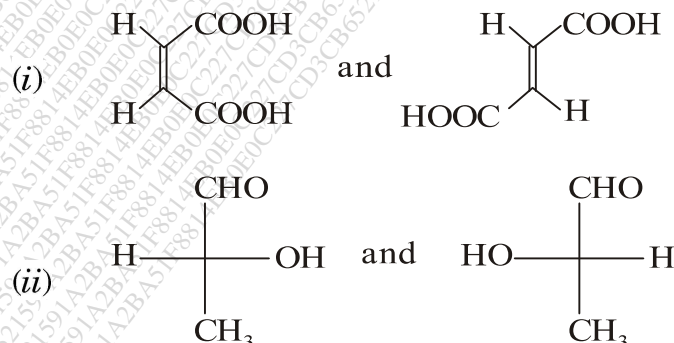
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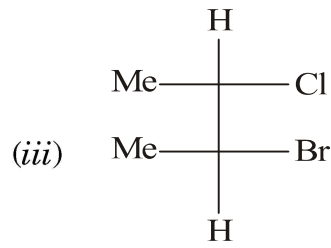
Illustrate the mechanism for the following reactions with suitable examples :

(i) Benzoin condensation

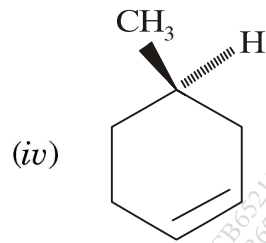
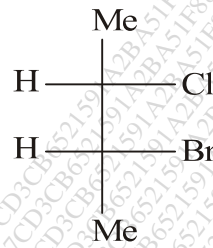
(ii) Mannich reaction.

(b) Indicate whether the relationship in each pair of compounds below is identical, enantiomeric or distereomeric by assigning R and S and E and Z configurations. 8

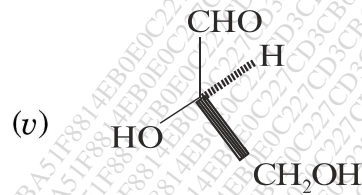
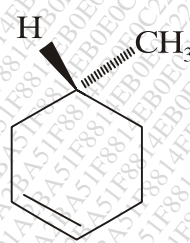




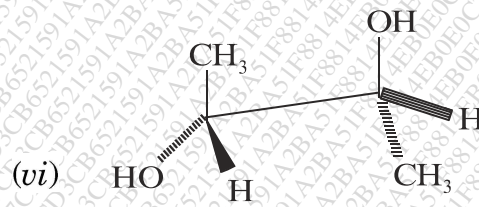
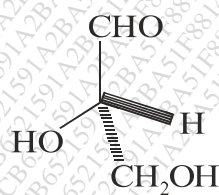
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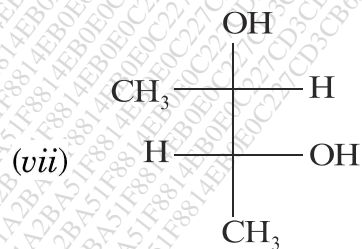
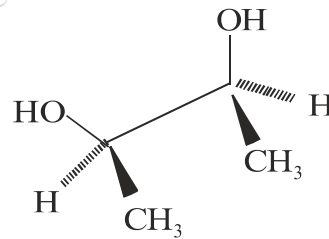
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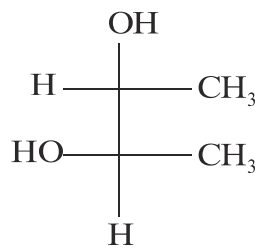
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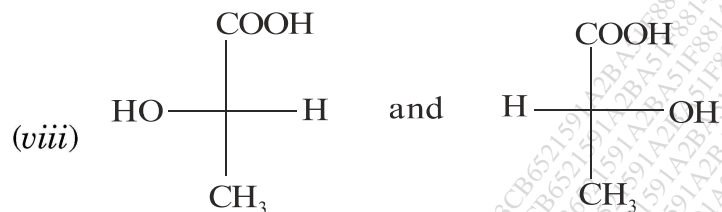
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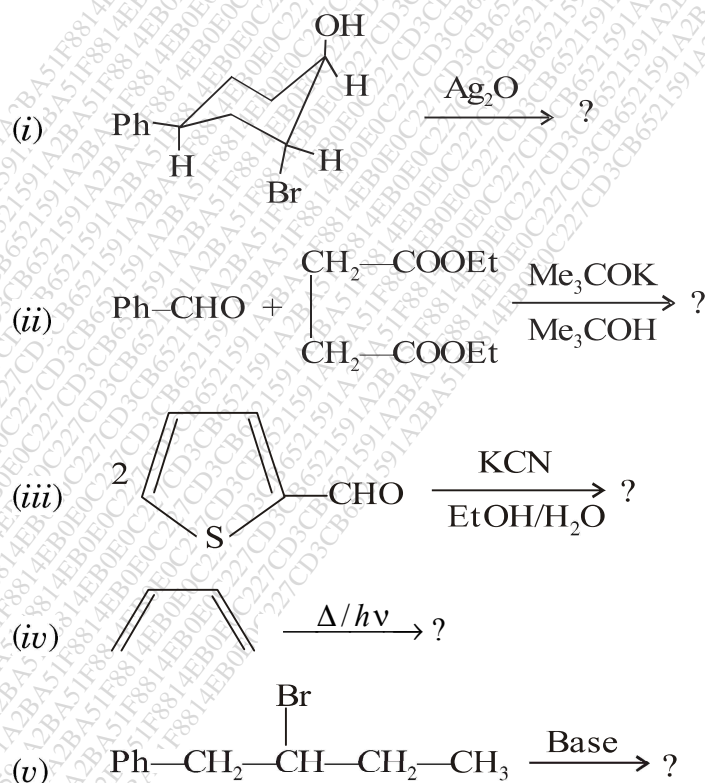
4. (A) Explain the following terms with proper examples : 7

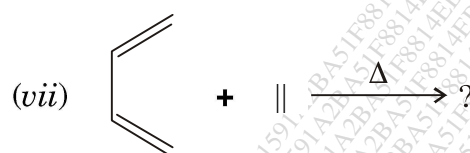
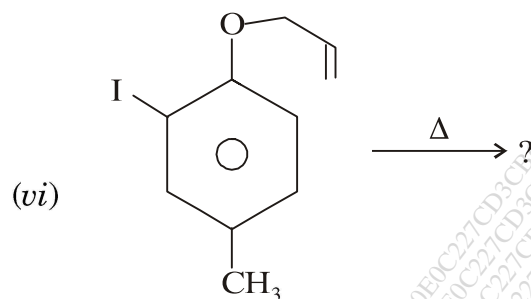
- (i) Conformation of Glucopyranose
 (ii) Conformation of Cyclohexane-1, 4-diol.

Or

What are Grignard Reagents ? What is the action of G. R. on Acetaldehyde, Carbon dioxide, Acetone ? Explain with mechanism.

(B) Predict the product(s) with appropriate mechanism of the following (any four) : 8





5. (A) Select the *correct* answer from the given options for each of the following : 5

(i) The catalyst used in Benzoin condensation reaction is

- (a) $K^{\oplus}Cl^{-}$
 (b) KCN
 (c) C_2H_5OH/H_2O
 (d) CN^{\oplus}

(ii) Eschenmoser salt in Mannich reaction is in character.

- (a) Electrophilic
 (b) Nucleophilic
 (c) Radical
 (d) None of the above

(iii) Reaction intermediate in E^1Cb reaction is

- (a) Carbocation
 (b) Carbanion
 (c) Benzyne
 (d) Six membered cyclic T.S.

P.T.O.

- (iv) Photocycloaddition of $(4n + 2) \pi$ system process is takes place by
- (a) Conrotation
 - (b) Disrotation
 - (c) Supra-suprafacial overlapping
 - (d) None of the above
- (v) Pyrolysis of Xanthate ester is known as
- (a) Hofmann elimination
 - (b) Saytzev elimination
 - (c) Cope elimination
 - (d) Chugaev reaction
- (B) Write short notes on any *two* of the following :
- (a) [55] sigmatropic rearrangement
 - (b) Wittig Reaction
 - (c) Aza Cope-Rearrangement.

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