

This question paper contains 6 printed pages]

AG—113—2018

FACULTY OF SCIENCE

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

OCTOBER/NOVEMBER, 2018

(CBCS Pattern)

CHEMISTRY

Paper II (CH-422)

(Organic Chemistry)

(Thursday, 29-11-2018)

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

Time—3 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) Cis-2-butene on addition of bromine gives *dl* mixture of 2, 3-dibromobutane.
- (b) Cope rearrangement is an intramolecular process.
- (c) What are the conditions that favour E'cb mechanism in an elimination reaction ? Illustrate with *two* examples.
- (d) Explain with suitable examples, the terms homotopic, enantiotopic and diastereotopic groups and faces.
- (e) What are sigmatropic rearrangement ? Give their stereochemistry. Say whether 5-methyl cyclopentadiene can offer such a rearrangement.

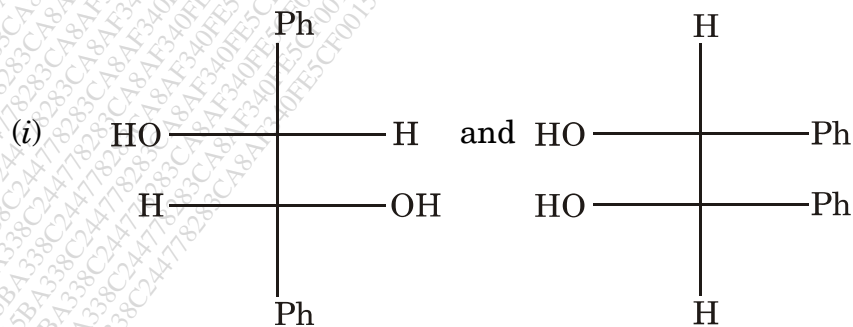
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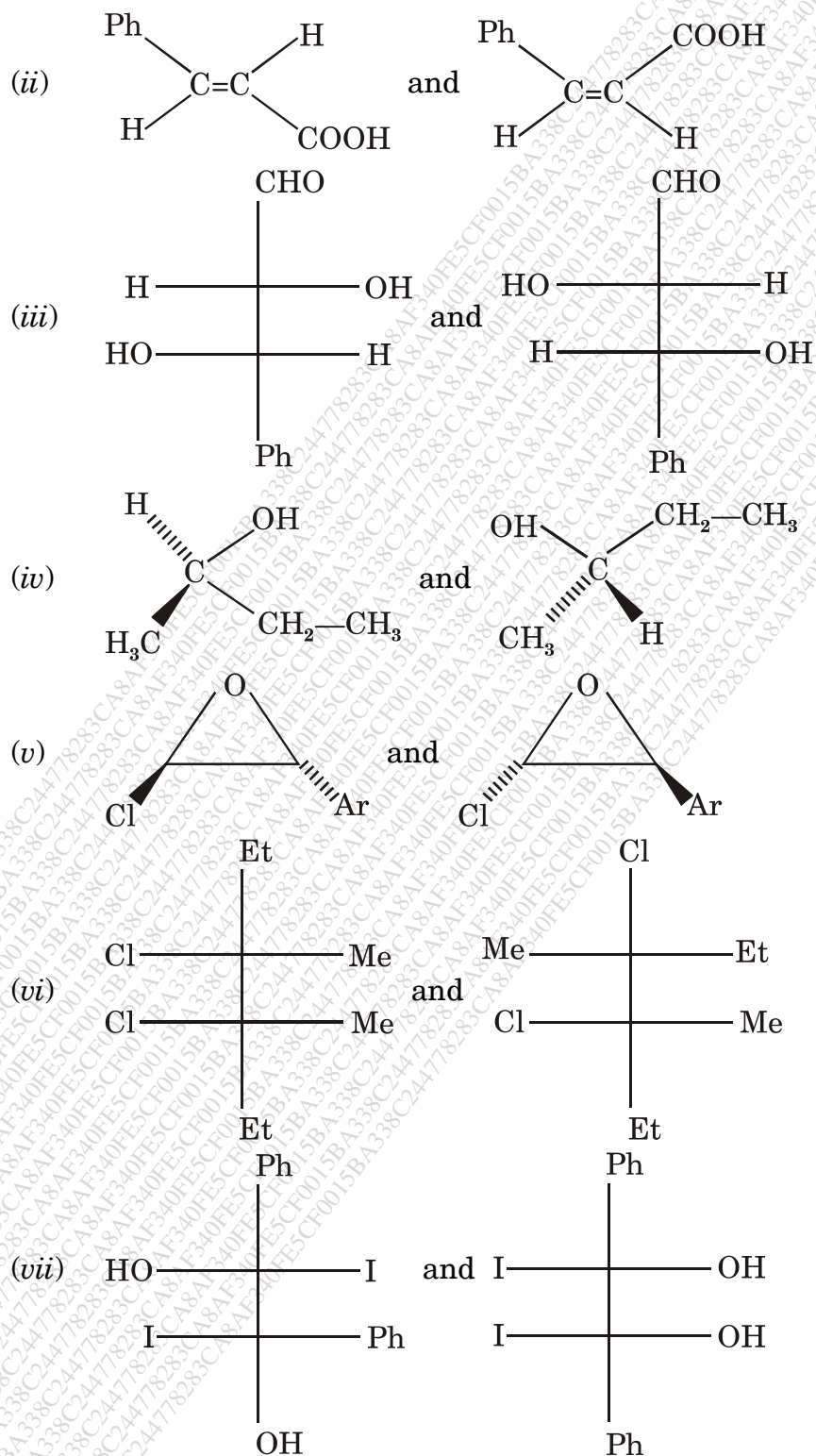
2. Answer any *three* of the following : 15
- Carbon dioxide reacts with Grignard reagent to form carboxylic acid but on treatment with organolithium compound yields ketone.
 - With the help of FMO and PMO method show that (2 + 2) cycloaddition reaction is photochemically allowed reaction.
 - What is Conformational Analysis and explain the order of stability of 1, 2 dimethyl cyclohexane.
 - In E^2 reaction a threo form gives trans alkene while an erythro form gives a cis olefin.
 - With the help of correlation diagram method, show that Diels Alder reaction is a thermally allowed process.
3. (a) With the help of FMO and correlation diagram method explain inter-conversion of 1, 3 butadiene into cyclobutene under thermal and photochemical condition. 7

Or

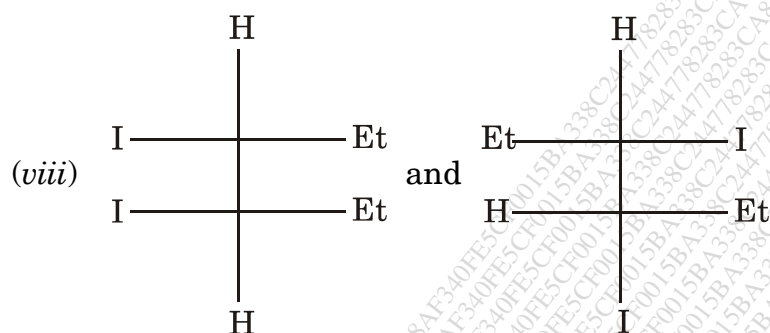
Illustrate the mechanism for the following reactions with suitable examples :

- Wittig reaction
 - Mannich reaction.
- (b) Indicate whether the relationship in each pair of compounds below is identical, enantiomeric or diastereomeric by assigning R and S configuration and E and Z configuration. 8





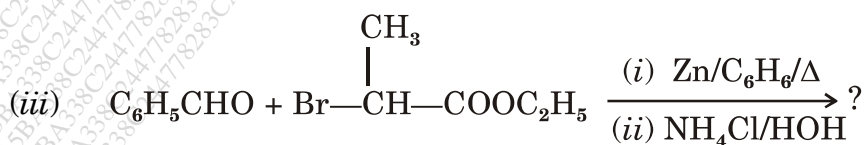
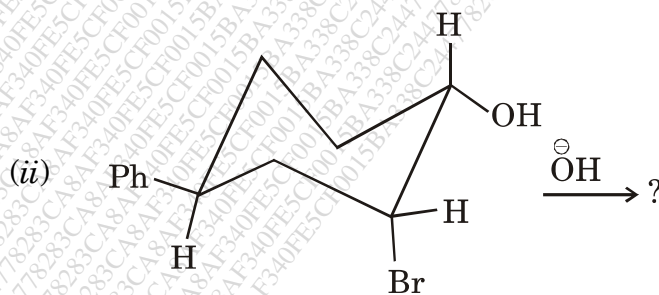
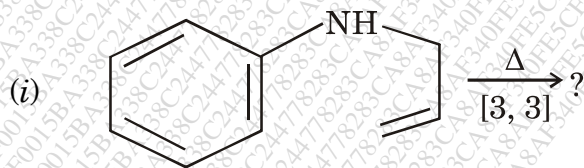
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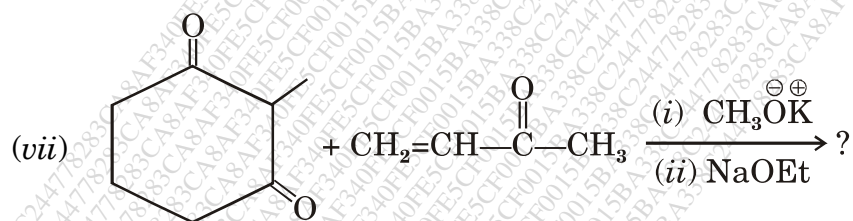
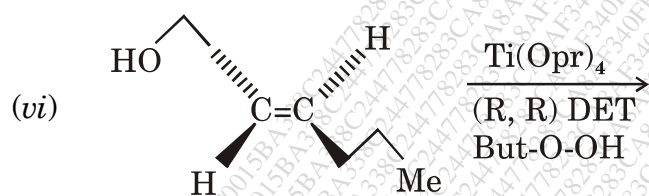
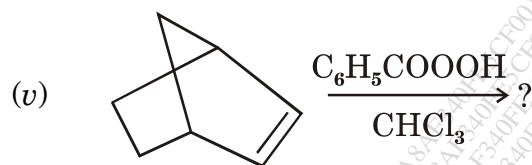
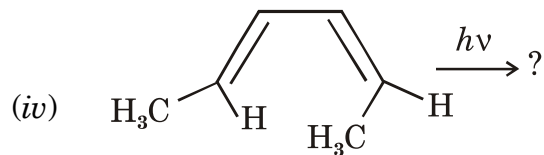


4. (a) Give the order of stability of different conformational isomer in chair form of 1, 3-dimethyl cyclohexane by drawing their chair conformation and Newmann projection formula of each and illustrating 1, 3 diaxial interaction. 7

Or

- (i) Reduction of ketone with LiAlH_4 is a hydride transfer reaction.
 (ii) Explain hydroboration.
- (b) Predict the products 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 major product formed by dehydration of 2-butanol with H_2SO_4 is :

- (a) Trans-2-butene
- (b) Cis-2-butene
- (c) 1-butene
- (d) 1, 3-butadiene

(ii) Addition of bromine to trans-2-butene gives :

- (a) meso form
- (b) *dl* pair of enantiomer
- (c) Both (a) and (b)
- (d) None of the above

P.T.O.

- (iii) The most suitable reaction for the synthesis of β -hydroxyester is :
- (a) Wittig reaction
 - (b) Reformatsky reaction
 - (c) Michael addition
 - (d) Mannich reaction
- (iv) Cycloaddition reaction between two ethylene molecules is symmetry allowed under :
- (a) Thermal
 - (b) Photochemical
 - (c) In the presence of base
 - (d) None of the above
- (v) Acetone on treatment with CH_3MgBr yields :
- (a) 2-propanol
 - (b) 1-propanol
 - (c) 2-methyl-2-propanol
 - (d) 2-butanol
- (b) Write notes on any *two* of the following :
- (a) Stereochemistry of allenes and spiranes
 - (b) Cheletropic reaction
 - (c) [1, 3] sigmatropic rearrangement.

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