

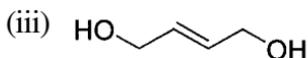
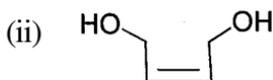
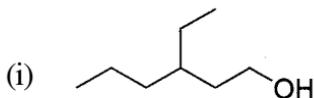
**L-7/2050**  
**ORGANIC SYNTHESIS-422**  
**(Semester-IV)**

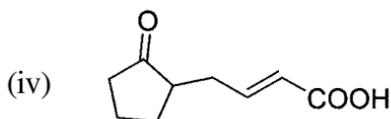
Time : Two Hours]

[Maximum Marks : 55

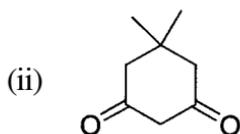
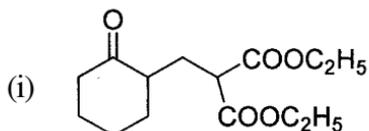
**Note** : Attempt any *four* questions. All questions carry equal marks.

- I. (a) What do you understand by the term umpolung. Demonstrate the application of 1,3-dithiane, cyanohydrane and vinyl ethers in umpolung of aldehydes.
- (b) Outline the mechanism of protection and deprotection of alcohol as tetrahydropyranyl ether (THP). What is the main disadvantage of this protecting group?
- II. (a) Using disconnection approach outline the synthesis of the following molecules.



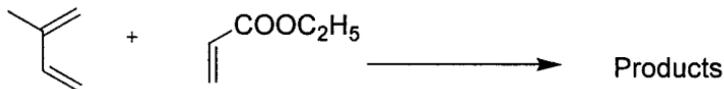


- (b) Based on disconnection approach outline the synthesis of the following molecules.



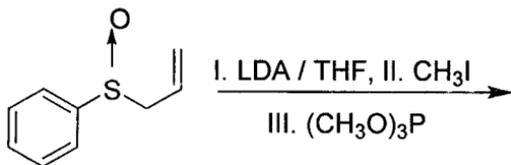
III. Write the retrosynthetic pathway and total synthesis of 11-oxoprogesterone.

IV. (a) Predict the product(s) along with the regioselectivity of the following cycloaddition reaction. How will you explain the stereo outcome of the reaction?



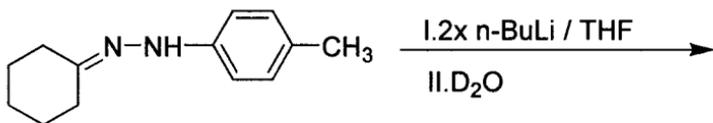
(b) Explain why intermolecular Diels-Alder cycloaddition reactions usually fail with unactivated dienophiles such as ethylene.

- V. (a) Predict the product of the following reaction and also explain the mechanism involved.

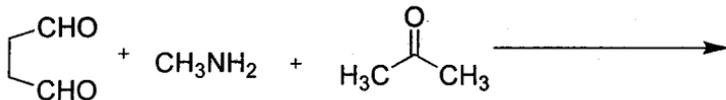


- (b) How will you synthesise  $\beta$ - lactones from carboxylic acids? Describe the reaction conditions under which these  $\beta$ - lactones can be converted into E / Z alkenes.

- VI. (a) Predict the product and explain the mechanism involved in this reaction. Give two evidence in support of your answer.



- (b) Write the product and mechanism of the following reaction. Which name reaction is involved in this reaction sequence?



- VII. (a) Explain the term kinetic and thermodynamic controlled enolate ion and also explain the condition for their generation.

- (b) Discuss the nature of medium effect (solvent) and alkylating agent on O Vs C alkylation of enolates.

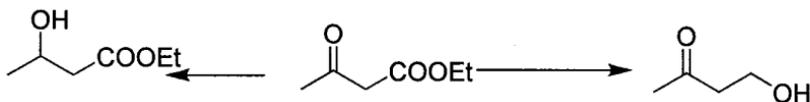
VIII. (a) In aldol condensation how will you explain the formation of 2,3-anti & syn product from E & Z enolate ion respectively?

(b) Dimethylsulfonium methylide and dimethylsulfoxonium methylide react with  $\alpha$ - $\beta$ -unsaturated ketone and results in formation of oxirane and cyclopropane derivative respectively. How will you explain this behaviour?

IX. (a) What do you understand by the term linear and convergent synthesis? Which approach is better and why?

(b) Explain the term synthetic equivalent group by taking appropriate example.

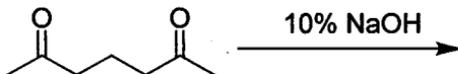
(c) How will you achieve following conversion by use of appropriate protecting group?



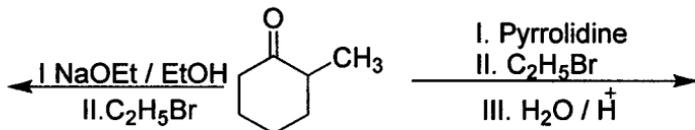
(d) How will you synthesise TM X by use of suitable protective group?



- (e) What is endo rule as applied to Diels Alder reaction?
- (f) Dihydroxylation of alkenes under Pr'evost conditions gives trans diol while Woodward conditions results in formation of trans diol explain.
- (g) What is the role of electron withdrawing group during conjugated addition across carbon-carbon double bond?
- (h) Which name reactions are involved in Robinsons annulation?
- (i) Predict the product(s) of following reaction:



- (j) Predict the product(s) of following reactions:



- (k) Explain why phosphonate ylides are more nucleophile than phosphonium ylides.

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