(For Non-CBCS Students Only)

B.Sc. (Honours) Examination, 2019

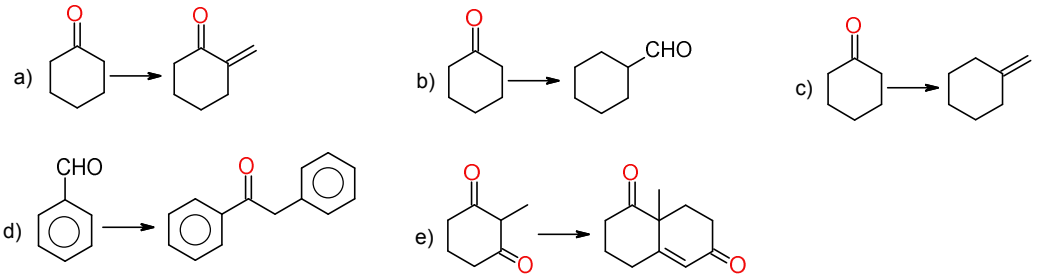
Semester-IV
Chemistry (Honours)
Course: BCHC-42
(Organic Chemistry)

Time: Three Hours **Full Marks: 30**

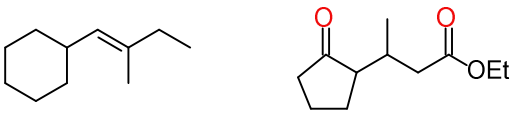
Questions are of value as indicated in the margin.
Answer ***three*** questions taking ***any one question*** from ***each of the unit***.

Unit-I

1. Carry out the following conversions. Give structure of the intermediate product(s), if there is any. Mention all the necessary reagents and reaction conditions properly. 2×5



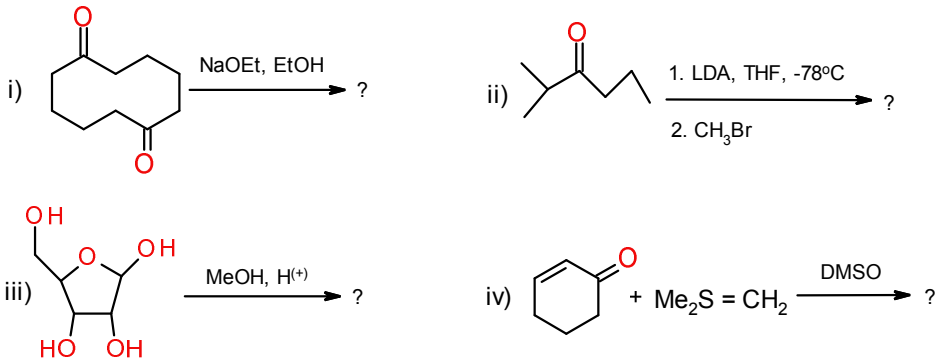
2. a) Propose the most suitable synthetic routes for the following compounds: 2×2



(I) (II)

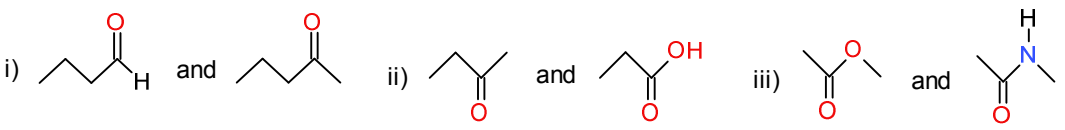
b) What is Burgi-Dunitz trajectory? Explain schematically. 2

c) Predict the product(s) in each case: 1×4



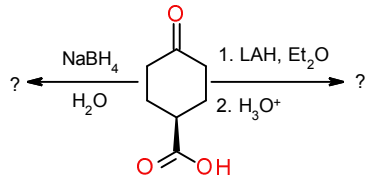
UNIT-II

1. a) Which of the compounds in each pair is more reactive towards nucleophilic attack? Justify your answer. 3×2



P.T.O.

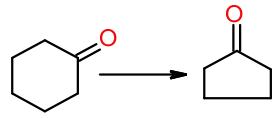
b) Identify the products with suitable stereochemistry (if applicable): 1+1



c) Compare the basicity of 1°, 2° and 3° amines. How can you distinguish them by a chemical test? 2

2. a) Carry out following conversions. Give reagents and reaction condition as well as the structure of the intermediate product(s), if there is any (***any four***): 2×4

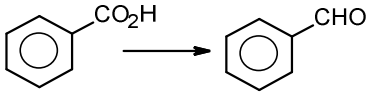
i) $CH_3CH_2CO_2H \longrightarrow CH_3CH_2NH_2$

ii) 

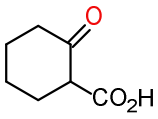
iii) $CH_3CH_2CH_2CH_2CO_2H \longrightarrow CH_3CH_2CH_2CO_2H$

iv) $CH_3CH_2CH_2CO_2H \longrightarrow CH_3CH_2CH_2CH_2CO_2H$

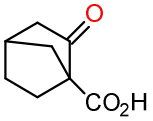
v) $Me_2{=}PPh_3 \longrightarrow Me_2CHCO_2H$

vi) 

b) Which of the following compounds will undergo decarboxylation? Explain. 2



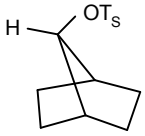
(I)



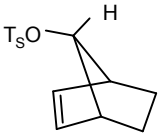
(II)

UNIT-III

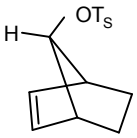
1. a) Compare the rate of acetolysis of the following compounds and give explanation in support of your answer: 5



(I)



(II)



(III)

b) Predict the product with appropriate stereochemistry. Justify your answer. 2.5×2

i) *Threo*-3-methoxy-2-bromobutane $\xrightarrow[AgOAc/\,AcOH]{\text{acetolysis}}$?

ii) *S*-2-phenylpropanol $\xrightarrow[2.\ H_3O^+]{1.\ MeMgI}$?

2. a) An ester (**A**) is formed by the reaction between benzylformic acid and (–)-2-octanol. When (**A**) reacts with MeMgI, (–)atrolactic acid is obtained as the major product. Identify (**A**) and give mechanistic pathway to explain the above reaction sequences and their stereochemical outcome. 4

b) Explain the following statements with the help of suitable examples (***any two***): 2×3

i) Anchimeric assistance

ii) Sterric approach control (SAC) and product development control (PDC)

iii) Cram's model for nucleopheophilic attack at carbonyl centre.

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