

Reg. No.

--	--	--	--	--	--	--	--



OCH 502

Third Semester M.Sc. Degree Examination, December 2018
(CBCS : 2016-17 Syllabus)
ORGANIC CHEMISTRY (New Syllabus)
Synthetic Reagents and Spectroscopic Techniques

Time : 3 Hours

Max. Marks : 70

Note : i) Answer Part – A and **any four** questions from Part – B.
ii) Figures to the right indicate marks.

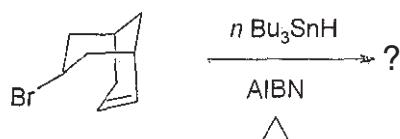
PART – A

1. Answer **all** the following sub-divisions : **(9x2=18)**

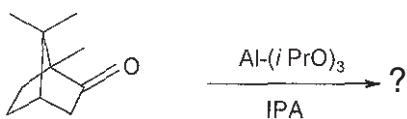
- a) Give any one method for the preparation of phenyl lithium in the laboratory.
b) Complete the following sequence



- c) Predict the product

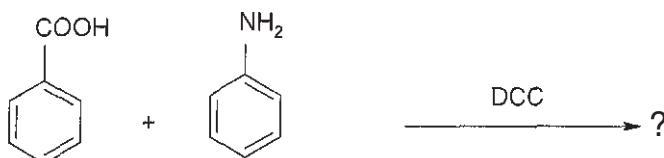


- d) Predict the product and indicate the name of the reaction.



- e) With an example illustrate how TMS-I is useful in the cleavage of ethers.

- f) Name and draw the structure of the product :

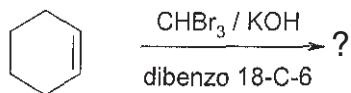


- g) Sketch the Karplus curve and indicate its importance.

- h) Identify the spin systems for protons of (i) ethyl bromide and
(ii) 1-chloro-4-nitrobenzene.



i) Complete the sequence and highlight the role of the crown ether



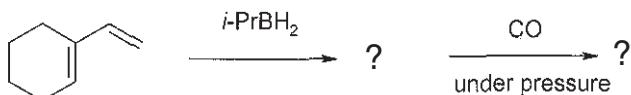
PART – B

Answer **any four full** questions :

(4×13=52)

2. a) Citing examples, describe the utility of Grignard reagents for the synthesis of (i) carboxylic acids and (ii) secondary amines.

b) Complete the following sequence



c) Discuss the Barton decarboxylation reaction with a suitable example. (4+4+5=13)

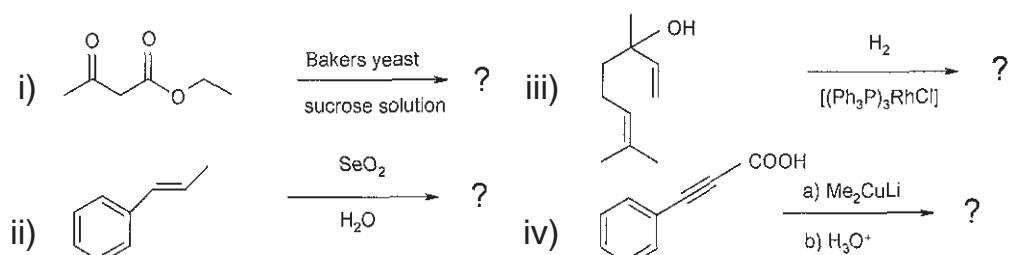
3. a) Discuss with mechanism the Peterson olefination reaction for the stereospecific synthesis of E- and Z- alkenes.

b) With examples, outline the synthesis of alkyl zincs from alkyl halides. Compare the reactivity of organozincs with Grignard reagents.

c) With mechanism, discuss the Stille-Kelly reaction for the synthesis of aromatics. (5+4+4=13)

4. a) What are Zeiglar-Natta catalysts ? Citing examples, highlight the utility of the catalysts in polymerization reactions. Briefly discuss mechanism of polymerization.

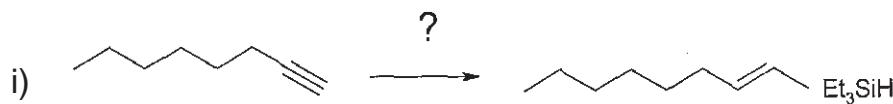
b) Complete- the following sequences and give reasons for the formation of the product/s.



(5+8=13)

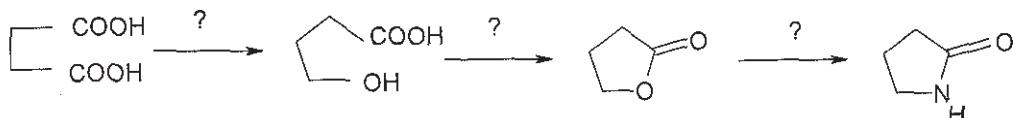


5. a) With examples, write a comparative account of the Woodward- and Prevost-hydroxylation reactions.
- b) Citing examples and mechanism write an account of phase transfer catalysis.
- c) Predict suitable reagents for the following transformations.



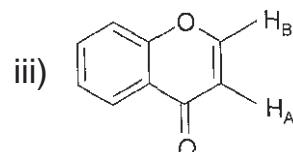
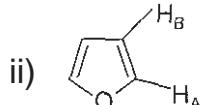
(5+4+4=13)

6. a) Suggest suitable reagents for the following transformations. How are the following conversions identified by IR spectroscopy ?



- b) Citing examples indicate how labile protons may be identified by ¹H-NMR spectroscopy.
- c) Sketch a synthesis of dibenzo[18]crown-6. Indicate the advantages of its use over 18-C-6. (5+4+4=13)

7. a) Indicate the splitting, approximate chemical shift values and spin system nomenclature for the protons in the compounds given below.



- b) Discuss alkene metathesis reactions employing ionic liquids.
- c) Derive the structural formula of an organic compound with the following data and assign the values :

Mol. Form. C₁₂H₁₄O₄

UV λ_{max} : 272 nm

IR: 2964, 2877, 2943, 1728 and 1277 cm⁻¹

¹H NMR : δ 1.49 (t), 4.44 (q) and 8.09 (s)

¹³C NMR: δ 14.3, 61.3, 129.5, 134.3 and 165.7

MS: m/e (rel. abund) 222, 194, 149 (100%), 76, 65, 29, 15.

(4+4+5=13)