

B.Sc. 3rd Semester (Honours) Examination, 2020-2021

CHEMISTRY

Course ID: 31413

Course Code: SHCHE/303/C-7

Course Title: Organic Chemistry III

Time: 1 Hour 15 Minutes

Full Marks: 25

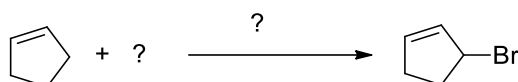
The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

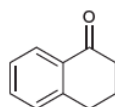
1. Answer *any five* questions:

1×5 = 5

- (a) Give the schematic diagram of Dow process for the synthesis of phenol.
- (b) Which intermediate involves in aromatic nucleophilic substitution?
- (c) Give the reagent for the conversion of 1-butyne to 1-butanal.
- (d) Give suitable reagent for the reaction.



- (e) Predict the major product obtained when the following compound is treated with Birch conditions.



- (f) Explain why benzaldehyde is less reactive than cyclohexanecarbaldehyde towards nucleophilic attack.
- (g) Give an example where B_{AC2} mechanism is observed.
- (h) Using umpolung reaction, show the synthesis of propanone from acetaldehyde.

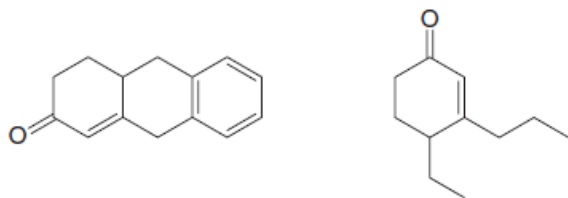
2. Answer *any two* questions:

5×2 = 10

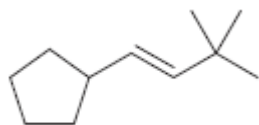
- (a) How will you prepare propanoic acid from ethanol using Grignard method and any other reagent? Why α -H of acetaldehyde is more acidic than H-attached to carbonyl group, although attached to more electronegative sp^2 C-atom? Why chloral hydrate is stable?

2+2+1 = 5

- (b) i) What starting materials are needed to synthesize each compound using Robinson annulation?



ii) Using any two organohalides of your choice (where each organohalide can have not more than six carbon atoms), show how you would prepare the following compound:

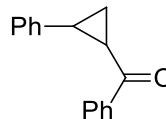
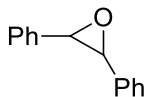
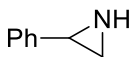
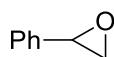


3+2 = 5

(c) Show how you will prepare lactic acid ($\text{CH}_3\text{CHOHCOOH}$) from acetaldehyde. Base promoted hydrolysis of methyl mesitoate occurs through an attack on the alcohol carbon – explain with reason.

2+3 = 5

(d) What is Corey-Chaykovsky reagent? Using this reagent how will you prepare the following compounds?



1+4 = 5

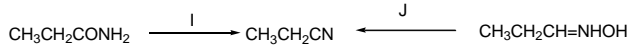
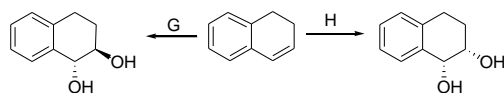
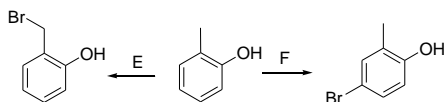
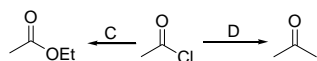
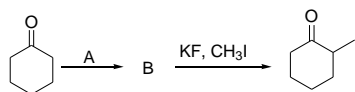
3. Answer *any one* question:

10×1 = 10

(a) Differentiate between Addition-Elimination reaction and Elimination-Addition reaction with proper example. When the aromatic compounds take part in nucleophilic substitution reaction? Give one example. Predict the reagents used for Gatterman-Koch, Gatterman reaction? What is *Ipsso*-substitution?

(3+2)+(1+1)+2+1 = 10

(b) Complete the following reactions and explain.



10×1 = 10