

70



(University of Choice)

**MASINDEMULIROUNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**UNIVERSITY EXAMINATIONS**

**2021 /2022 ACADEMIC YEAR**

**THIRD YEAR SPECIAL/SUPPLIMENTARY EXAMINATION**

**FOR THE DEGREE  
OF**

**BACHELOR OF SCIENCE (CHEMISTRY) & (INDUSTRIAL  
CHEMISTRY)**

**COURSE CODE: SCH 330**

**COURSE TITLE: ORGANIC SYNTHESIS**

**DATE: 25/07/2022**

**TIME: 8-10 a.m.**

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INSTRUCTIONS TO CANDIDATES

Total Marks: 70

Answer all the Questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

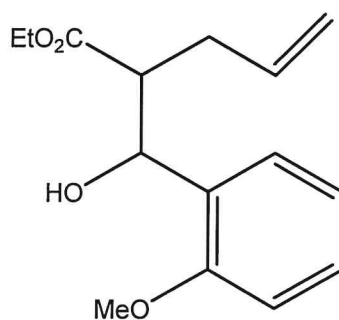
This Paper Consists of 6 Printed Pages. Please Turn Over.

**Question one (16mks)**

i. Define the following terms as used in Organic Synthesis (5mks).

- a. Retrosynthesis
- b. Catenation
- c. Target molecule
- d. Synthetic equivalent
- e. Synthetic tree

ii. Study compound **(1)** below carefully and answer the following question.



a. Carry out Retrosynthesis of the target molecule **(1)** and provide the synthons and synthetic equivalents expected from the disconnection. (4mks)

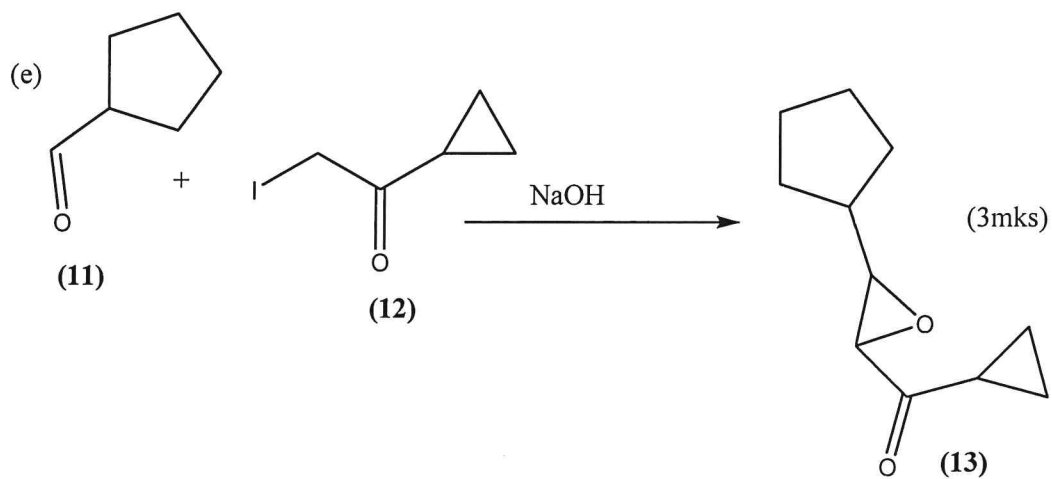
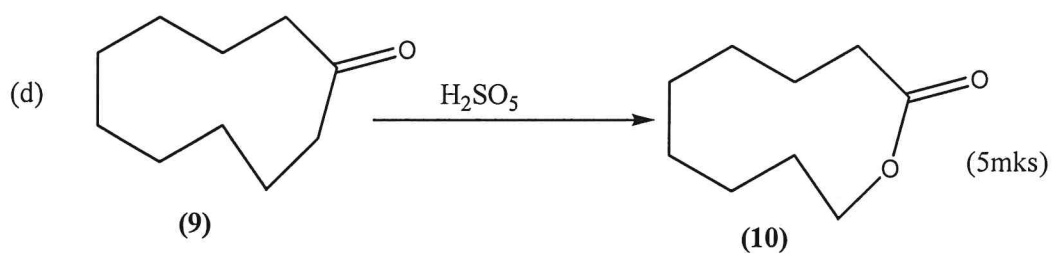
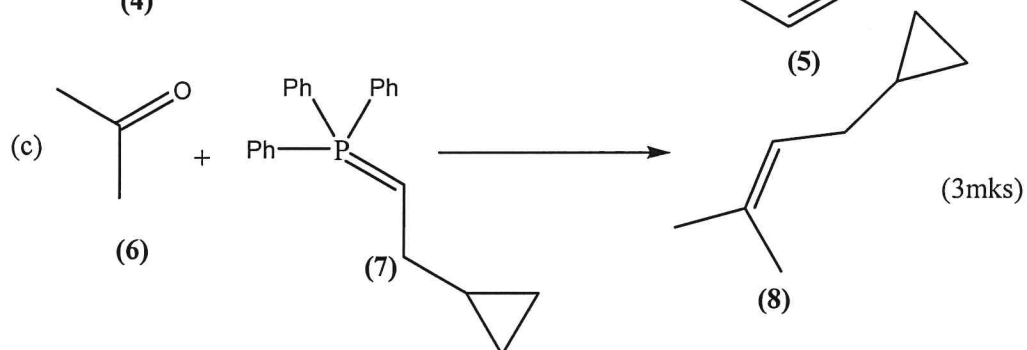
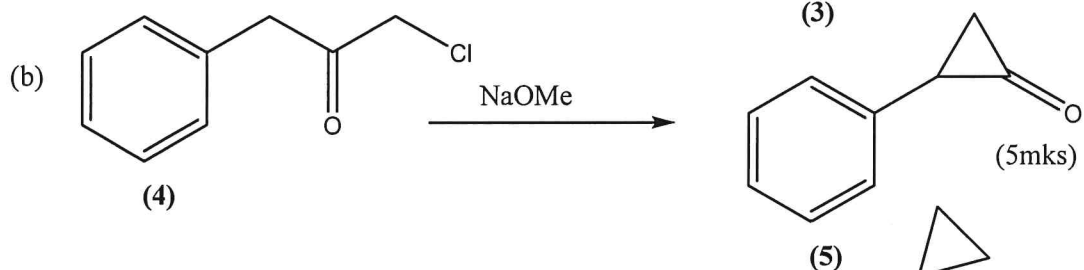
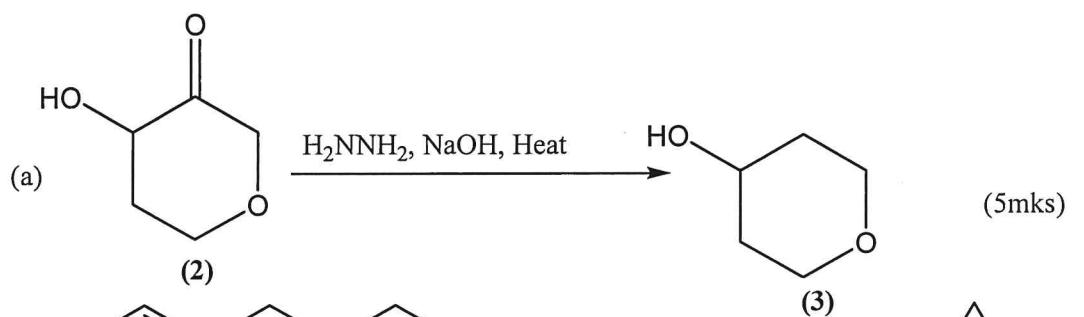
b. Give the synthetic write up of the target molecule **(1)** above providing reagents for each step. (5mks)

iii. By use of an illustration, give an example of,

a. A method of protecting carboxylic acids in an organic molecule with OH functional group (1mks)

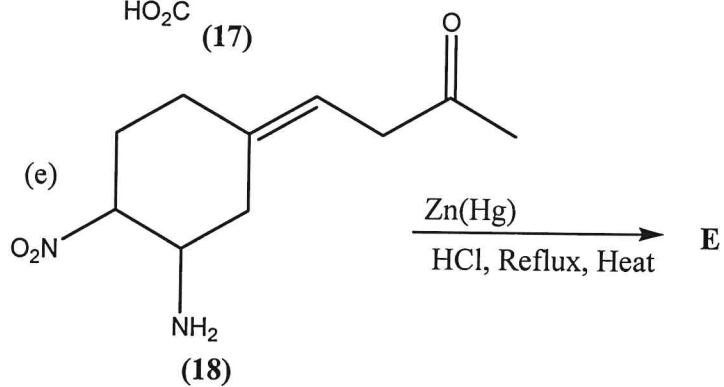
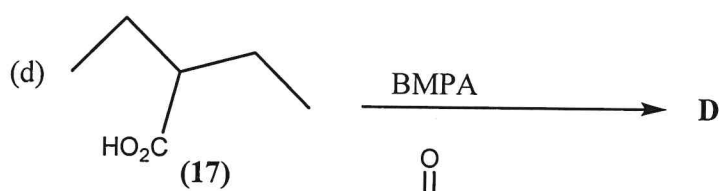
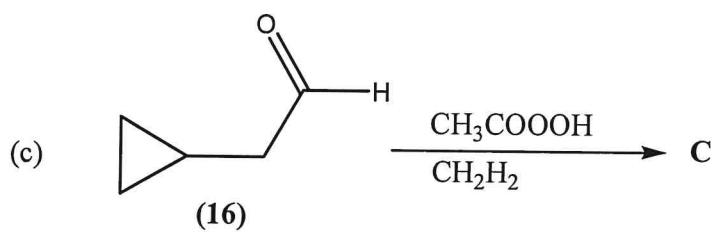
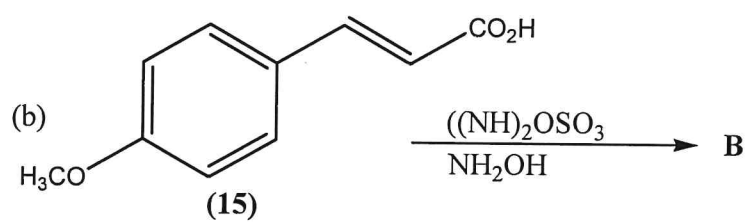
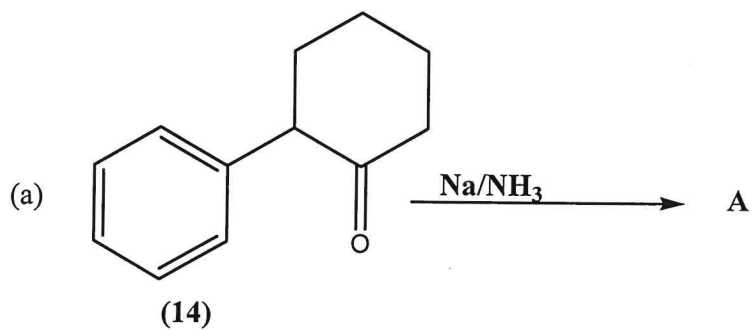
b. The use of lindlar's catalyst in synthesis (1mks)

**Question Two (20mks)**

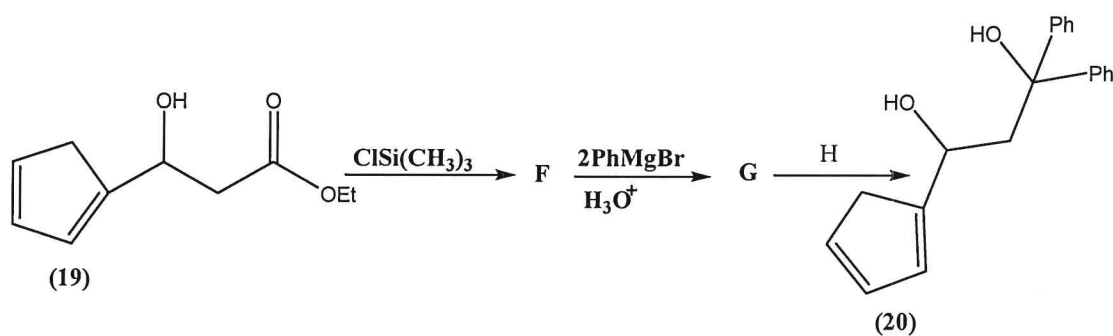


**Question Three (16 mks)**

i. Give the major products **A** to **E** of the following reactions

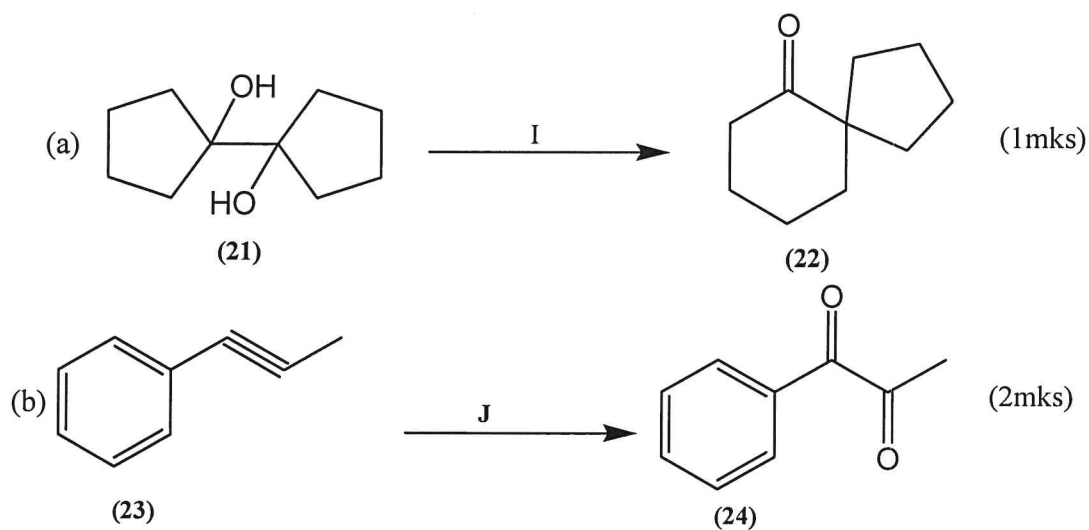


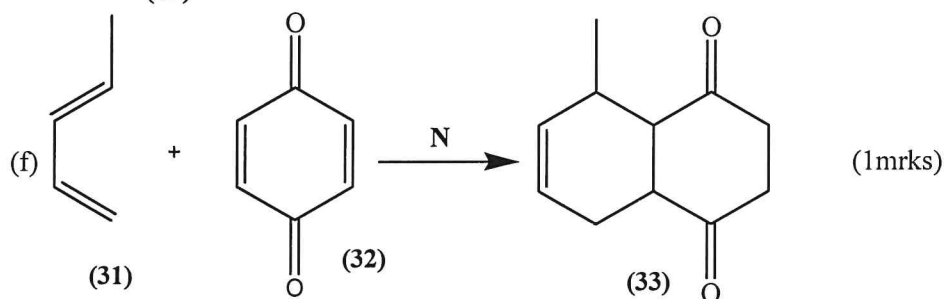
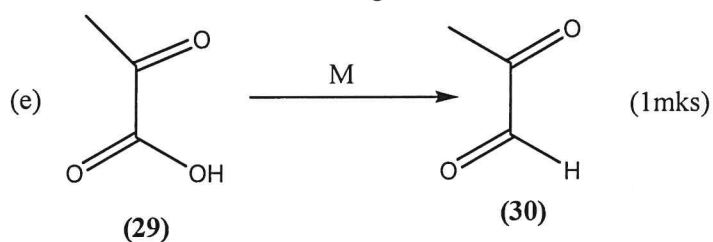
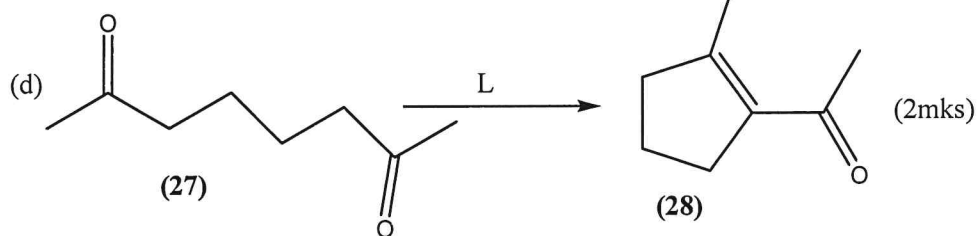
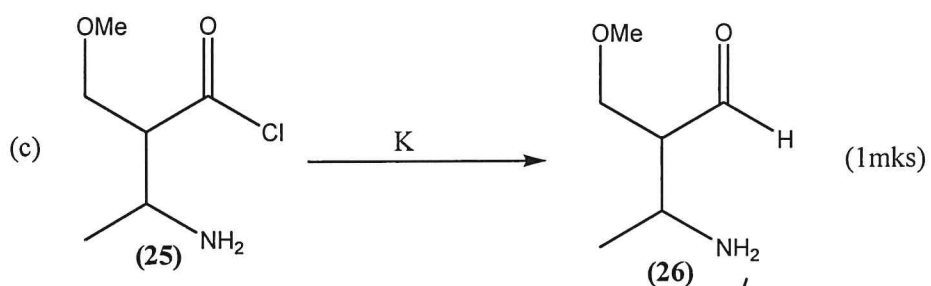
- ii. State one application of crown ethers in organic synthesis (1mks)
- iii. Highlight two considerations crucial for choosing a protecting group in the protection of alcohols and amines in organic synthesis. (2mks)
- iv. The reaction below shows the conversion of compound 19 to 20. Use it to answer the questions that follow.



- a. Provide the products F, G and reagents H. (3mks)
- b. Propose a plausible mechanism for the reaction. (5mks)

**Question four (17mks)**





- i. Give the name of the reaction in (a) above and write the mechanism of that reaction (3mks)
- ii. Write the mechanism of the reaction in (d) above. (4mks)
- iii. Give a plausible mechanism for the reaction in (f) above. (3mks)

THE END