

This question paper contains 7 printed pages]

NY—212—2023

FACULTY OF SCIENCE

M.Sc. (Second Year) (Fourth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New/CBCS Pattern)

ORGANIC CHEMISTRY

Paper-XXII-OCH-523

(Organic Synthesis : Retro Synthesis Approach)

(Monday, 11-12-2023)

Time : 2.00 p.m. to 5.00 p.m.

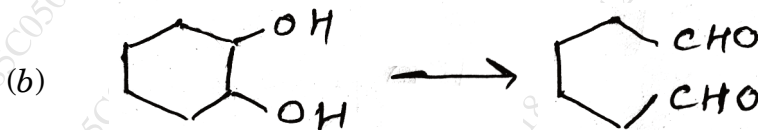
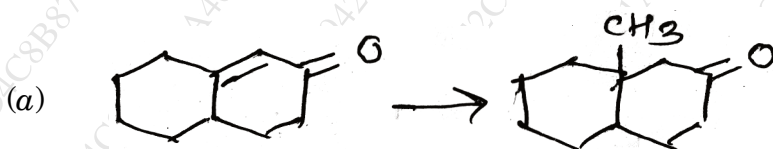
Time—3 Hours

Maximum Marks—75

N.B. :— (i) Attempt all questions.

(ii) Figures to the right indicate full marks.

1. Suggest the suitable reagents for the following conversions (any three) : 15

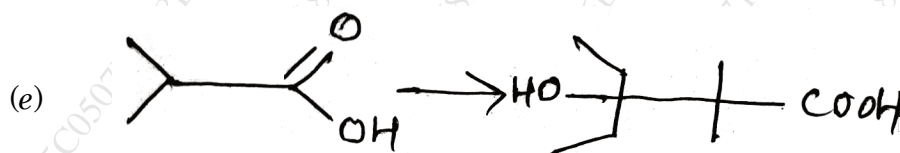
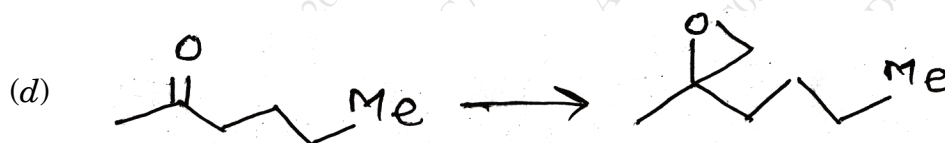
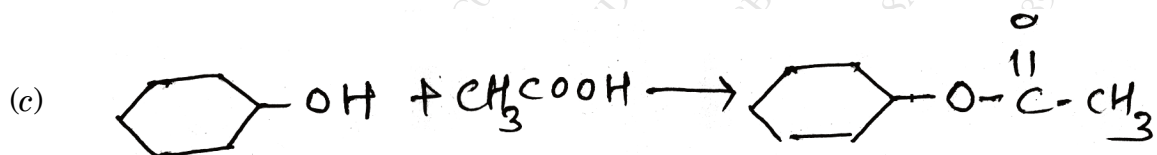


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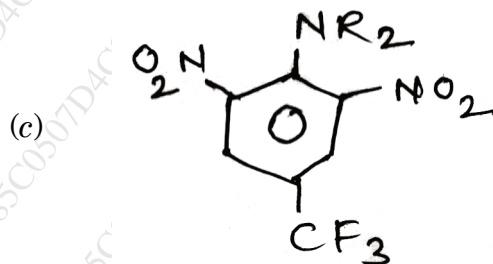
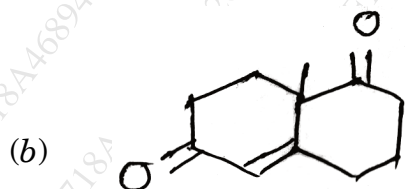
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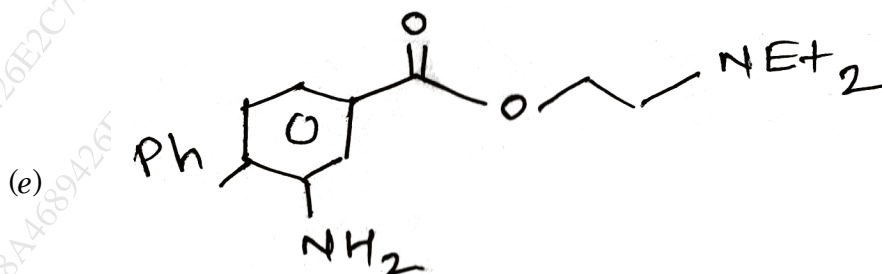
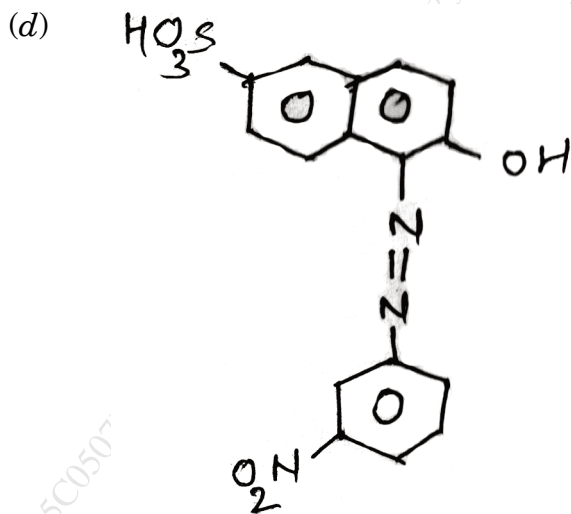
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2. Using Retrosynthesis, suggest suitable mechanism for the synthesis of the following (any three) : 15





3. Solve the following :

(a) Explain with suitable example :

8

(i) Concept of protecting Functional Group

(ii) Umpolung concept.

P.T.O.

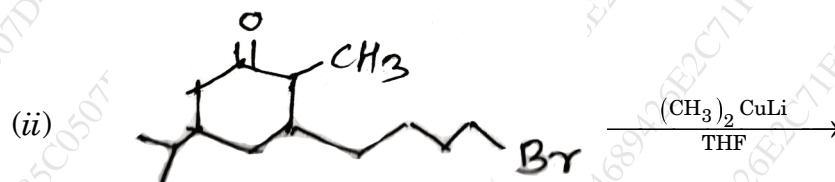
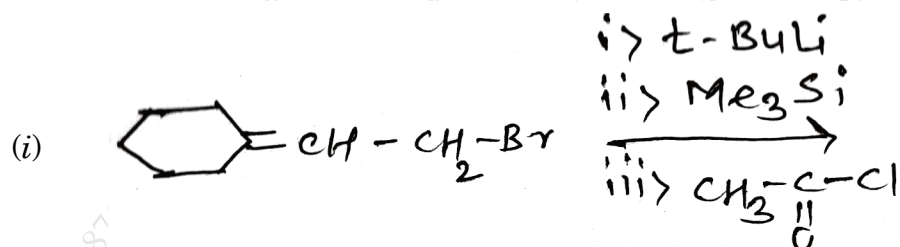
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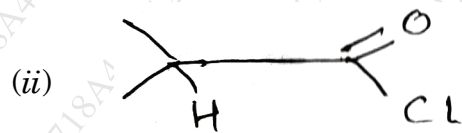
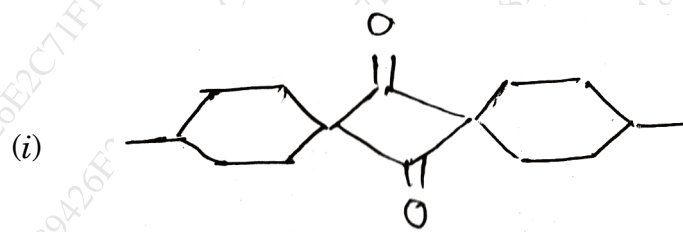
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Or

Predict the product with mechanism :

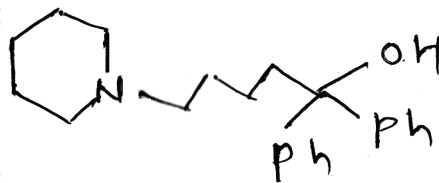


(b) How will you synthesize the following compounds using Ketene : 7



Or

(i) Suggest the retrosynthesis path for the following compounds :



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(5)

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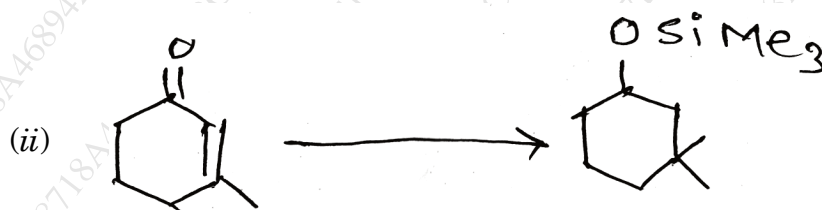
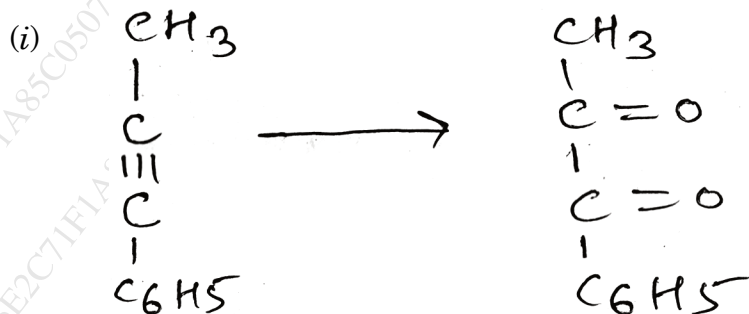
(ii) Use of nitro compounds in the synthesis of :



4. Answer the following :

(a) Suggest suitable reagent for the following conversion and justify with mechanism :

7



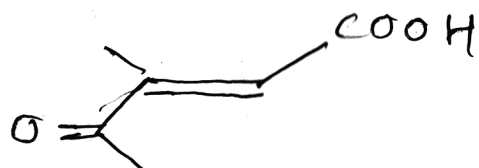
Or

Solve the following :

(i) Explain with example, synthesis of five members aromatic heterocyclic rings.

P.T.O.

- (ii) Control of enantioselectivity in the following carbonyl condensation :



- (b) Discuss the retrosynthetic analysis of camphor. 8

Or

Discuss the protection of amino group and carbonyl group using suitable example.

5. (a) Select the correct answer from the following alternatives : 5

- (i) Synthetic equivalent of CH_3^- is :

- (a) CH_3MgBr
 (b) $(\text{CH}_3)_2\text{CuLi}$
 (c) CH_3Li
 (d) All of the above

- (ii) The more reactive acid derivative is :

- (a) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{NH}_2$
 (b) $\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl}$
 (c) $(\text{RCO})_2\text{O}$
 (d) $\text{R}-\text{COOR}^1$

- (iii) DCC reagent is
- (a) Oxidizing
 - (b) Dehydrating
 - (c) Reducing
 - (d) Both (a) and (b)
- (iv) 1, 5-difunctionalized compound on disconnection gives :
- (a) Michael acceptor
 - (b) Epoxide
 - (c) Aldehyde
 - (d) Carboxylic acid
- (v) Enamines are prepared for the protection of :
- (a) $>CH_2$
 - (b) $>C=O$
 - (c) $-NH_2$
 - (d) $>C = C<$

(b) Write short notes on any two :

10

- (a) Lead tetraacetate
- (b) Robinson annulation
- (c) Give the synthetic utility and limitations of PPA.