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NEPWT-87-2024

FACULTY OF SCIENCE AND TECHNOLOGY

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

NOVEMBER/DECEMBER, 2024

ORGANIC CHEMISTRY

Paper-I (SCHECT-1502)

(Organic Synthesis)

(Thursday, 12-12-2024)

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

Time—3 Hours

Maximum Marks—80

N.B. := (i) Question No. 1 is compulsory.

- (ii) Solve any three from remaining five questions.
- 1. Solve the following:

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(a) Predict the product of the following reaction with mechanism:

$$\begin{array}{c|c} & & & & \\ \hline & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ &$$

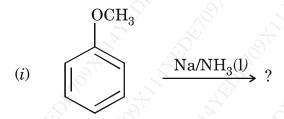
- (b) Explain Vilsmeier-Haack reaction with mechanism.
- (c) Predict the product of the following reaction? Comment on its chemoselectivity:

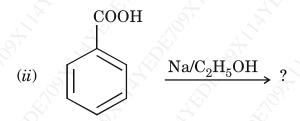
$$\begin{array}{ccc} \text{HO} & & & \text{CNH}_4)_2\text{Ce (NO}_3)_6 \\ \hline & & & \\ \text{NaBrO}_3, \text{CH}_3\text{CN} \end{array}$$

P.T.O.

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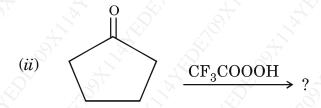
(d) Complete the following reaction:





- 2. Answer the following:
 - (a) Complete and outline the mechnism of the following reaction:

$$(i) \qquad \begin{array}{c} H \\ C = N \end{array}$$



- (b) Give the uses of the following oxidising agent with mechanism in organic synthesis:
 - (i) OsO₄
 - (ii) HIO₄.

3. Explain the following:

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- (a) What is Corey-Winter olefication? Explain with suitable example and mechanism.
- (b) How will you obtain the following compounds using suitable reagent?

 Explain with mechanism:

(i)
$$\bigcup_{H}^{O}$$
 using DCC

- (ii) Cl using red Alumina.
- 4. Solve the following:
 - (a) Predict the product of the following reaction with mechanism: 20

(i)
$$O$$
NH Br_2 .-NaOH
?

(ii) MeO—COOH
$$\frac{(i) \text{ EtOH } (ii) \text{ NH}_2-\text{NH}_2}{(iii) \text{ HNO}_2 (iv) \text{ C}_6\text{H}_6} ?$$

P.T.O.

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(b) Predict the product of the following reactions with mechanism:

(i)
$$\frac{\text{TiCl}_4/\text{Zn}}{\text{THF}}?$$

(ii) Cl COOCH₃ (ii) Pd(OAc)₂ (iii) PPh₃ (iii)
$$K_2CO_3$$
 130°C

- 5. Solve the following:
 - (a) Predict the product of the following reaction with mechanism:

$$(i) \qquad \overbrace{\text{OH}} \qquad \overbrace{\text{Teagent}} \qquad ?$$

(ii) OH
$$Ag_2CO_3$$
 ?

- (b) How will you convert carboxylic acid into alcohol using the following reagents, explain with mechanism:
 - (i) BH₃
 - (ii) LiAlH₄.

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6. Write short notes on the following:

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- (a) Pinacol-pinacolone rearrangement
- (b) Bathford Steven's and discuss role of solvent
- (c) Lead tetraacetate
- (d) Hydrogenolysis using BBr_3 and HI.

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