

This question paper contains 4+1 printed pages]

**ST—65—2022**

**FACULTY OF SCIENCE**

**M.Sc. (Fourth Semester) EXAMINATION**

**JUNE/JULY, 2022**

**(New/CBCS Pattern)**

**ORGANIC CHEMISTRY**

**Paper-XX-OCH-541**

**(Advanced Heterocyclic Chemistry)**

**(Wednesday, 29-06-2022)**

**Time : 2.00 p.m. to 5.45 p.m.**

**Time— 3.45 Hours**

**Maximum Marks—75**

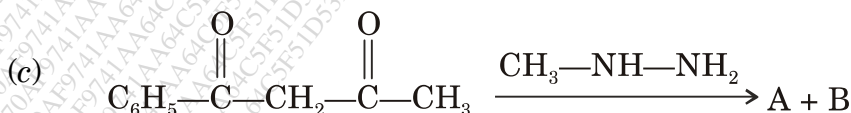
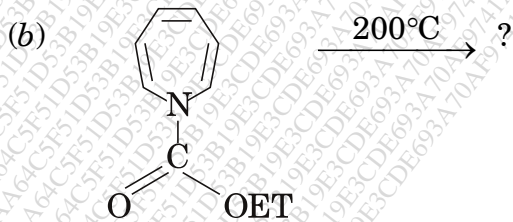
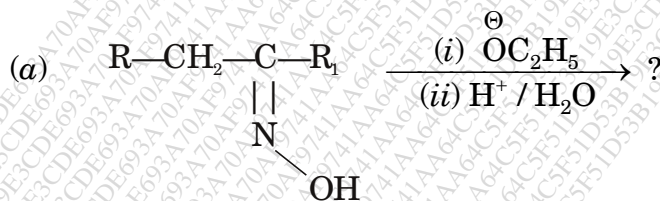
**N.B. :— (i) Attempt all questions.**

**(ii) Figures to the right indicate full marks.**

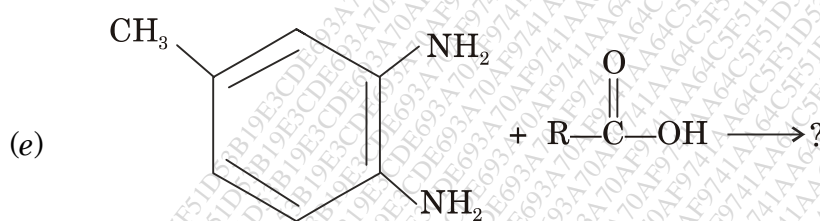
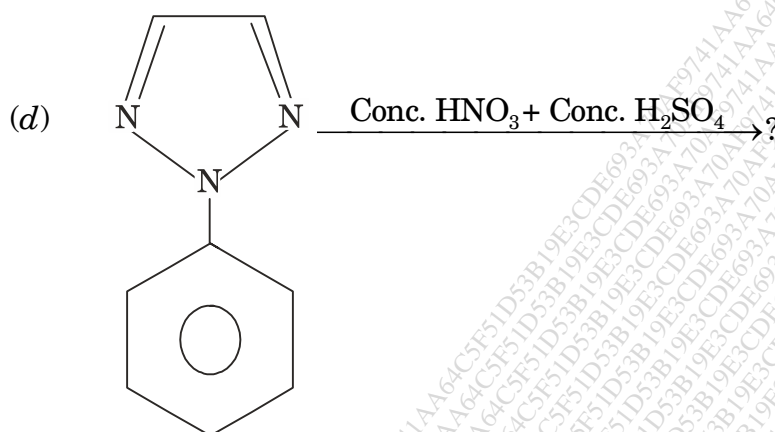
**(iii) Multiple to the right indicate full marks be attempted only once on page number three of answer-book with complete answer.**

**1. Predict the products in any three of the following :**

**15**

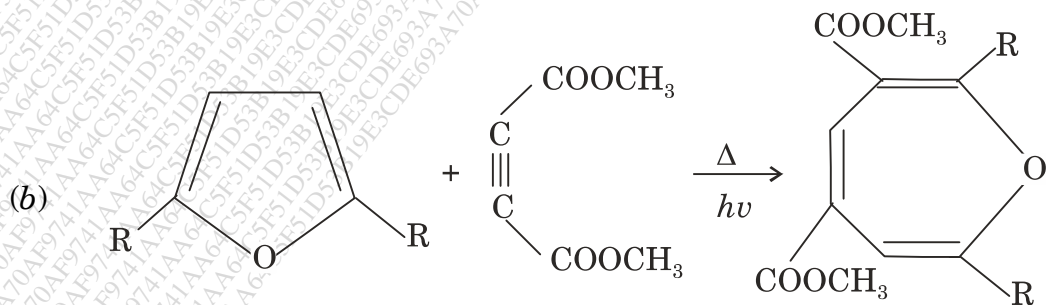
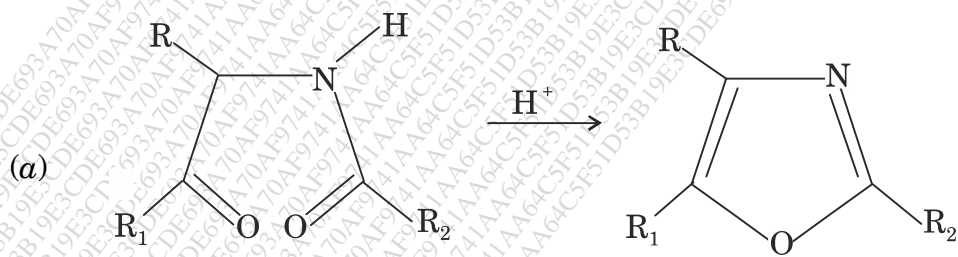


**P.T.O.**



2. Suggest the mechanism for any *three* of the following :

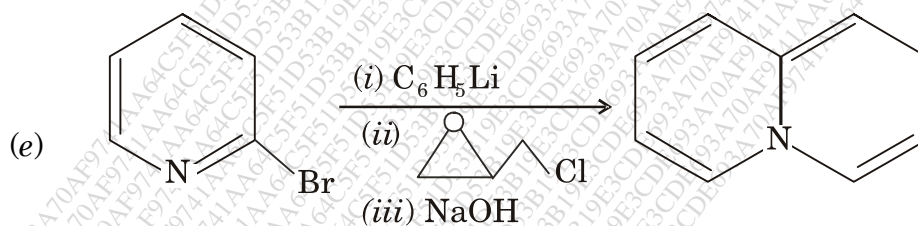
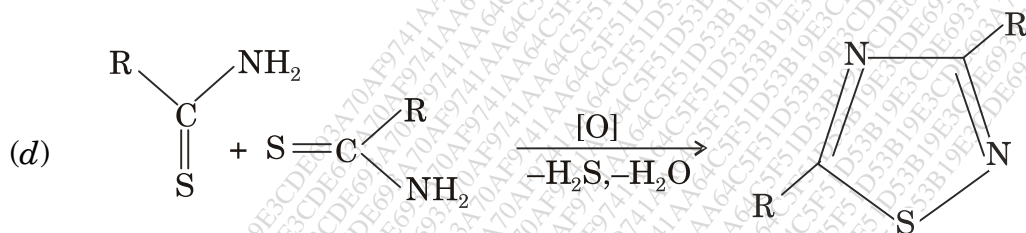
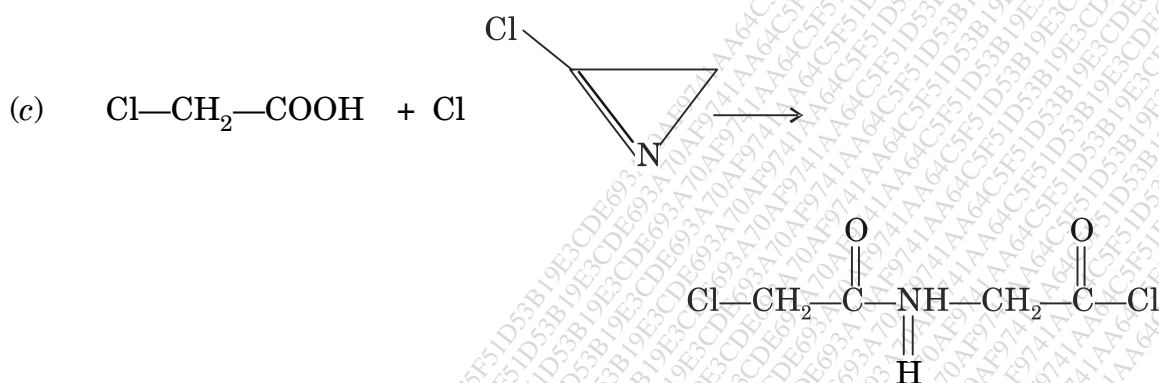
15



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ST-65-2022



3. (i) Indicate how the following reagents can be useful for the synthesis of 1, 2, 4-Thiadiazoles : 8

- (a) Thioamide
- (b) Amidine and Thiocarboxylic ester
- (c) Amidine and Thiocyanate.

Or

Explain synthesis of Benzimidazoles :

- (a) From *o*-phenelene diamine and Carboxylic acid
- (b) From *o*-phenelene diamine and Cyclohexanone.

P.T.O.

- (ii) Explain the synthesis of diaziridines : 7
- (a) from Hydroxylamine-o-sulfonic acid and ketone.
- (b) from Schiff's Base.

*Or*

Synthesis of Diazepines :

- (a) from 1, 7-diazopenta 2-4-diene.
- (b) from pyridine-N-ylides.

4. (i) Give the chemical reaction of oxazoles : 8
- (a) The Diels-Alder reaction
- (b) Reaction with nucleophilic reagent.

*Or*

Synthesis of Azepines :

- (a) from valency bond isomerisation.
- (b) from cyclopentadienone and Azirines.

- (ii) Explain Hantzsch-Widmann system of nomenclature with suitable example. 7

*Or*

Explain the synthesis of Quinolizinium ion from :

- (a) 2-Cyanopyridine
- (b) Condensation reaction.

5. (A) Select the correct alternatives from the following : 5
- (i) The stem irine may be used for rings containing only :
- (a) N (b) S
- (c) O (d) Se



- (ii) Saturated nitrogen containing four membered ring is known as :
- (a) azetane (b) aziridine  
(c) azirane (d) azetidene
- (iii) Diaziridine is ..... compound containing two nitrogen atoms in a three membered ring.
- (a) Unsaturated (b) Saturated  
(c) Anionic (d) Cationic
- (iv) For 1, 2 4-Thiadiazole the attack of nucleophiles takes place at :
- (a) 4th position (b) 2nd position  
(c) 5th position (d) 3rd position
- (v) Azocines is an aza analogue of :
- (a) cyclohexane (b) cycloheptene  
(c) cyclo-octatetraene (d) cyclodecane
- (B) Write short notes on (any two) :
- (a) Imidazole  
(b) Azetidines  
(c) Triazines.

10