

This question paper contains 4+2 printed pages]

**AG—45—2018**

**FACULTY OF SCIENCE**

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

**OCTOBER/NOVEMBER, 2018**

**(CBCS Pattern)**

**ORGANIC CHEMISTRY**

**Paper (CH-541/2)**

**(Advanced Heterocyclic Chemistry)**

**(Tuesday, 27-11-2018)**

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

*Time—3 Hours*

*Maximum Marks—75*

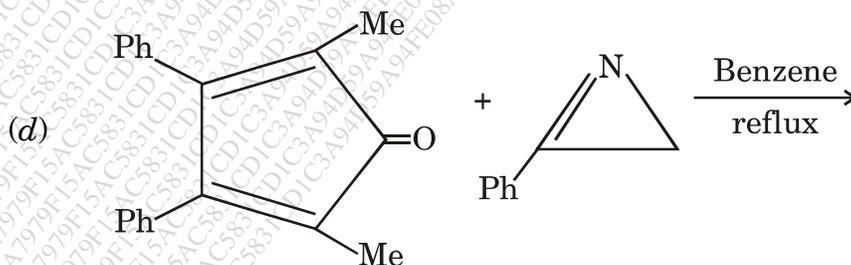
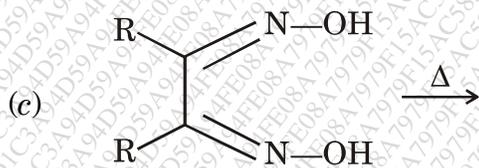
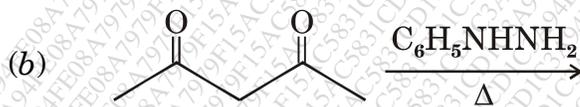
*N.B. :— (i) Attempt All questions.*

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

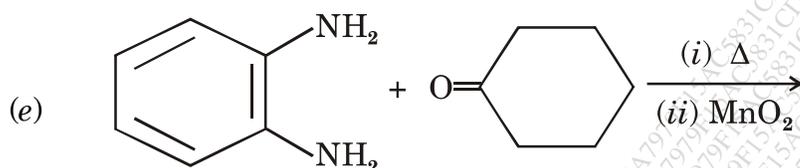
*(iii) Multiple to the right indicate full marks be attempted only once on page number three of answer-book with complete answer.*

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

15

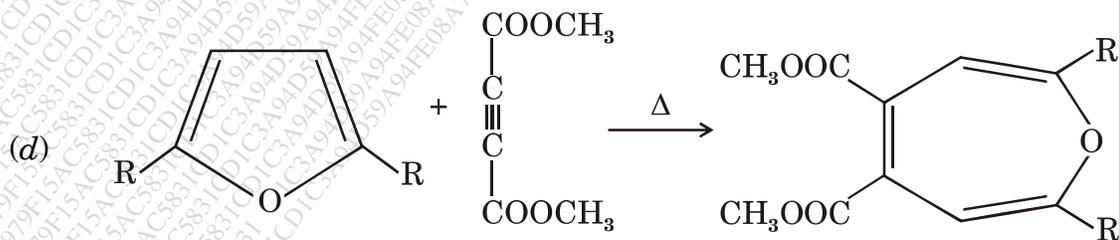
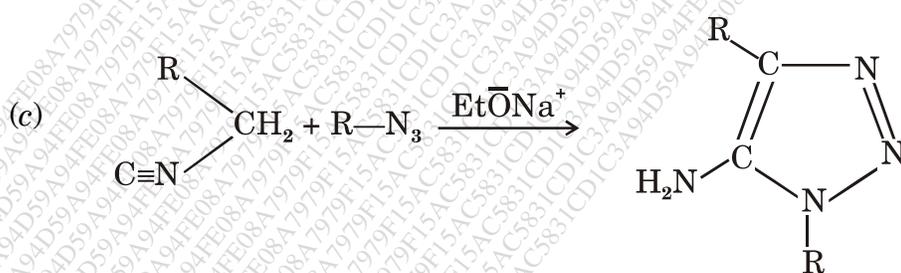
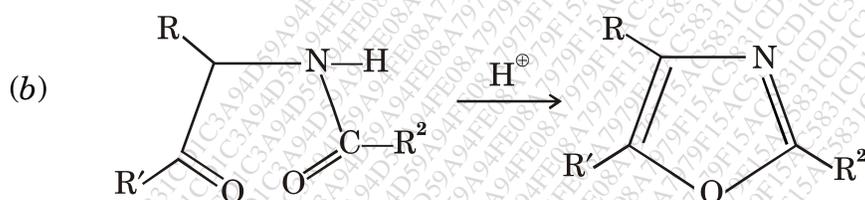
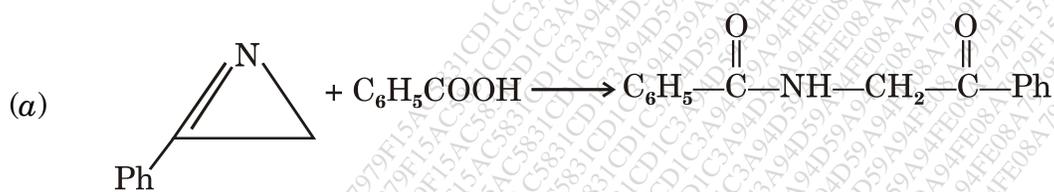


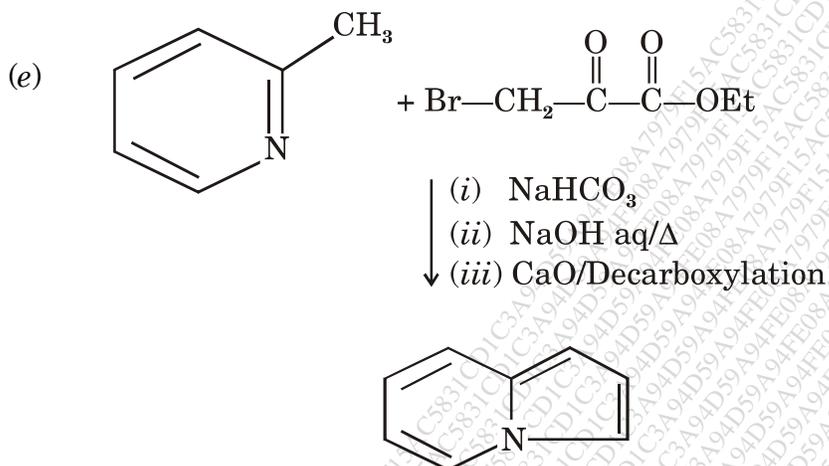
P.T.O.



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

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3. (a) Explain synthesis of Thiiranes :

8

- (i) From 2-mercapto ethanol and  $\text{COCl}_2$
- (ii) From epoxide and thiocyanate ion.

Or

Explain the following chemical reactions of triazoles :

- (i) Metallation and alkylation
- (ii) Nitration of 2-phenyl triazole
- (iii) Acid-base reaction of triazole.

(b) Explain the chemical reactions of oxepines :

7

- (i) Oxepines with Maleic anhydride (Diels-Alder reaction).
- (ii) Photochemical reaction oxepine.

P.T.O.

Or

Give the synthesis of benzoxazole :

- (i) From *o*-aminophenol and carboxylic acid.
- (ii) From *o*-aminophenol and orthoformic trimethyl ester.

4. (a) Synthesis of pyrazines :

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- (i) From 1, 2-diketocompounds
- (ii)  $\alpha$ -amino carboxylic acid.

Or

Synthesis of azepines :

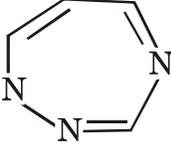
- (i) From valency bond isomerisation
  - (ii) From cyclopentadienone and azirines.
- (b) Describe Hantzsch-Widman system of nomenclature for single and fused ring heterocycles. 7

Or

Give the synthesis of quinolizinium ion/salt :

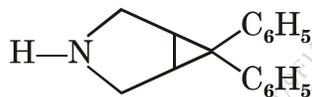
- (i) From 2-picolyllithium and  $\beta$ -hydroxy propionaldehyde
- (ii) From 2-acetyl pyridine and 3, 3-diethoxy propyl magnesium chloride.

5. (A) Select the *correct* alternative and rewrite the complete sentence : 5

(i) The IUPAC name of heterocycle  is :

- (a) 1, 2, 4-azepine
- (b) 1, 2, 4-triazole
- (c) 1, 2, 4-triazine
- (d) 1, 3, 4-triazine

(ii) The IUPAC name of heterocycle :



- (a) 6, 6-diphenyl-3-azabicyclo [3.1.0] hexane  
(b) 6, 6-diphenyl-4-azabicyclo [3.1.0] hexane  
(c) 2, 2-diphenyl-3-azabicyclo [3.1.0] hexane  
(d) 6, 6-diphenyl-3-azabicyclo [3.1.1] hexane

(iii) Open chain isomer of diazirine is .....

- (a) diazomethane  
(b) diazoethane  
(c) diazothiane  
(d) diazomercaptane

(iv) 1, 2, 3-triazole is ..... compound.

- (a) non-aromatic  
(b) aromatic  
(c) antiaromatic  
(d) pseudoaromatic

P.T.O.

(v) Quinazoline heterocycle contains ..... no. of heteroatom.

(a) three

(b) two

(c) one

(d) four

(B) Write notes on any *two* of the following : 10

(i) Pyridine-N-oxides

(ii) Azetidines

(iii) Thiazoles.