This question paper contains **5** printed pages]

L—45—2019

FACULTY OF SCIENCE

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

MARCH/APRIL, 2019

(CBCS Pattern)

CHEMISTRY

(CH-541/2)

(Advanced Heterocyclic Chemistry)

(Tuesday, 23-4-2019) **Time : 2.00 p.m. to 5.00 p.m.**

Time—3 *Hours* *Maximum Marks*—75

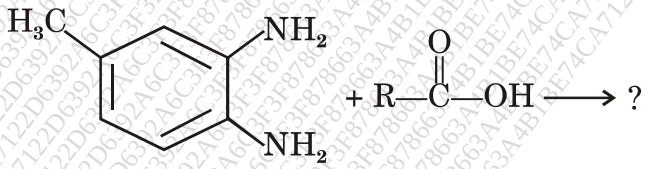
N.B. :— (*i*) Attempt *All* questions.

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

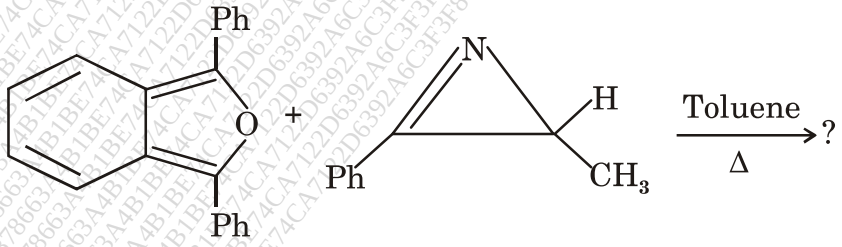
(*iii*) Multiple Choice Questions (MCQs) should be attempted only once on page No. **3** of answer-book with complete answer.

1. Predict the products in any *three* of the following : 15

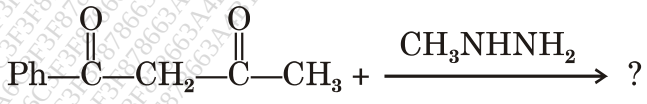
(*a*)



(*b*)



(*c*)



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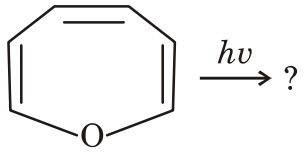
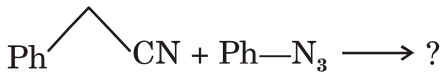
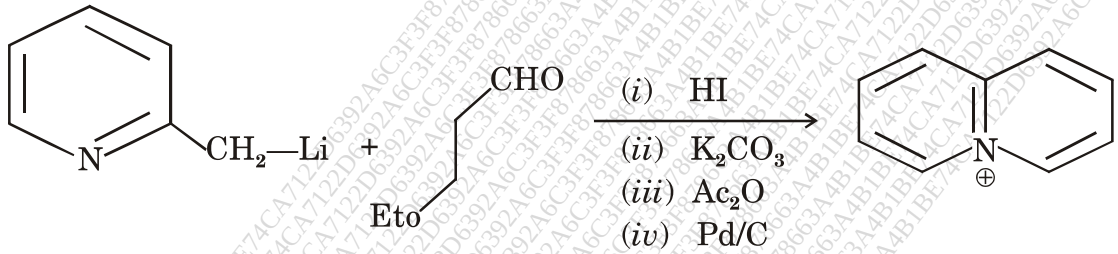
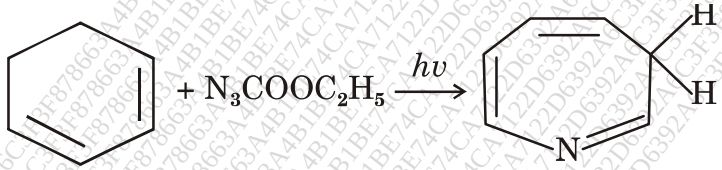
(*d*) 

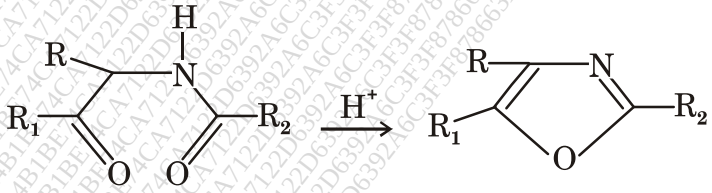
(*e*) 

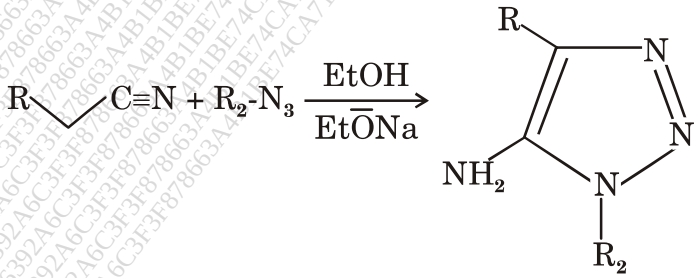
2. Suggest the mechanism for any *three* of the following : 15

(*a*) 

(*b*) 

(*c*) 

(*d*) 

(*e*) 

3. Solve the following : 15

(*a*) Explain the following reactions of thiadiazole :

(*i*) 3, 5-dimethyl 1, 2, 4 thiadiazole with *n*-butyl lithium.

(*ii*) 5-amino 1, 2, 4-thiadiazole with HNO_2 followed by mesitylene. 8

Or

Explain synthesis of benzimidazole : 8

(*i*) From *o*-phenylene diamine and carboxylic acid.

(*ii*) From *o*-phenylene diamine and cyclohexanone.

(*b*) Give the synthesis of diazepines : 7

(*i*) From 1, 7-diazopenta 2-4-diene

(*ii*) From pyridine-N-ylide.

Or

Explain synthesis of azetidines from : 7

(*i*) Isoxazole derivatives

(*ii*) Cyclization method.

4. Solve the following : 15

(*a*) Explain the Hantzsch-Widman nomenclature system for heterocyclic compounds. 7

Or

Explain the synthesis of azepines : 7

(*i*) By valence bond isomerisation method.

(*ii*) From azirines.

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(*b*) How will you obtain benzothiazole from : 8

(*i*) O-aminophenol and carboxylic acid

(*ii*) N-aryl thioamides.

Or

How will you obtain pyrimidine from : 8

(*i*) Malonic ester and urea

(*ii*) Acetylacetone and amidine

(*iii*) Acetophenone and formamide.

5. (A) Select the *correct* answer from the following Multiple Choice Questions and rewrite answer : 5

(*i*) Six membered ring contains two nitrogens and one oxygen is called :

(*a*) Thiadiazole (*b*) Pyrazole

(*c*) Oxadiazine (*d*) Triazine

(*ii*) The stem irine may be used ring containing any .....

(*a*) N (*b*) S

(*c*) O (*d*) Se

(*iii*) For 1, 2, 4-thiadiazole the attack of nucleophile takes place at :

(*a*) 4th position (*b*) 2nd position

(*c*) 6th position (*d*) 3rd position

(*iv*) The stability of azepine tautomers decreases in the order .....

(*a*) 1H > 4H > 3H (*b*) 1H > 3H > 4H

(*c*) 4H > 1H > 3H (*d*) 3H > 4H > 1H

(*v*) Azocine is the aza analogue of .....

(*a*) Cyclopentadiene (*b*) Cyclohexadiene

(*c*) Cycloheptadiene (*d*) Cyclooctatetraene

(B) Write short notes on (any *two*) : 10

(*i*) 1, 2, 3-triazine

(*ii*) Imidazole

(*iii*) 1, 4-diazepines.