

This question paper contains 7 printed pages]

AI—51—2017

FACULTY OF SCIENCE

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

MARCH/APRIL, 2017

(CBCS Pattern)

CHEMISTRY

Paper (CH-541/2)

(Advanced Heterocyclic Chemistry)

(Friday, 21-4-2017)

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

Time— Three Hours

Maximum Marks—75

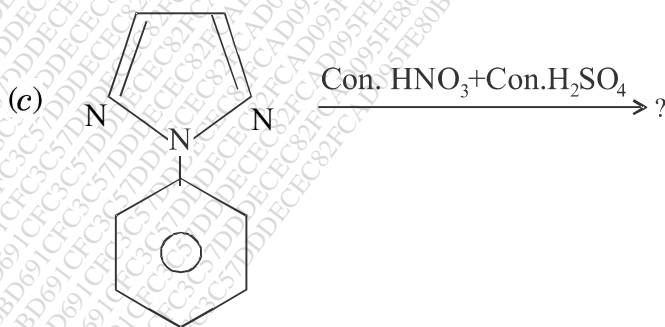
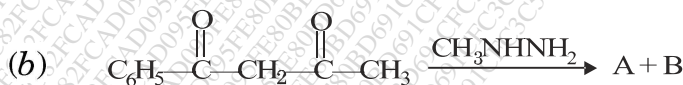
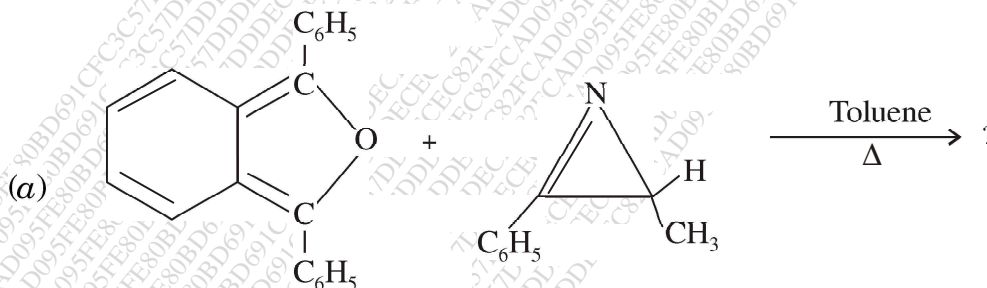
N.B. :— (i) Attempt All questions.

(ii) Figures to the right indicate full marks.

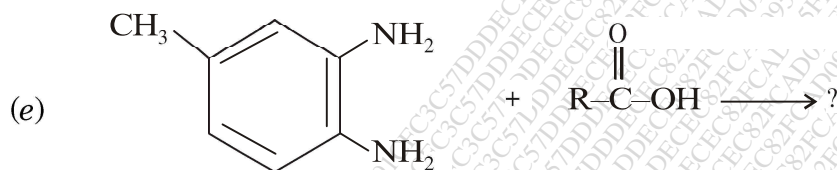
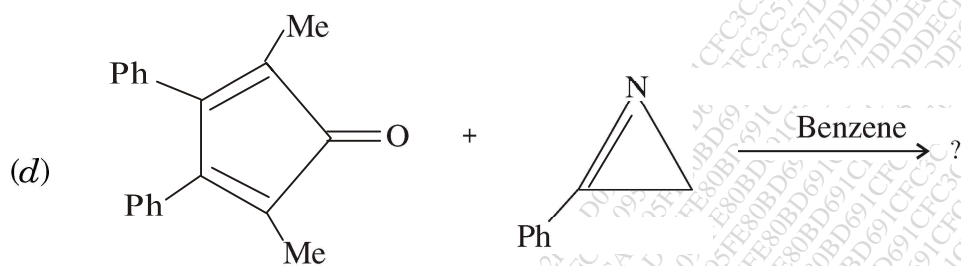
(iii) Multiple choice questions (MCQs) should be attempted only once on page number three of the answer-book complete answer.

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

15

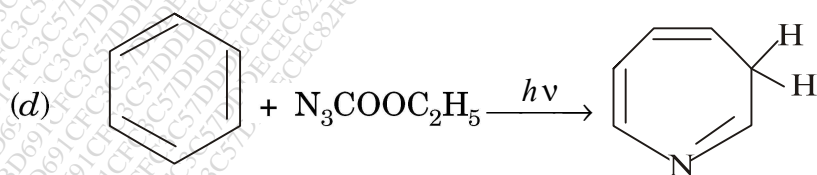
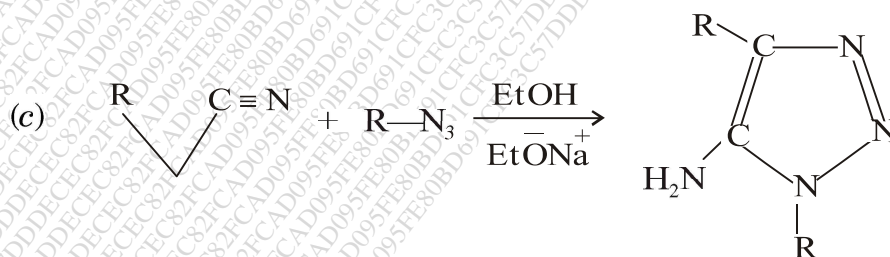
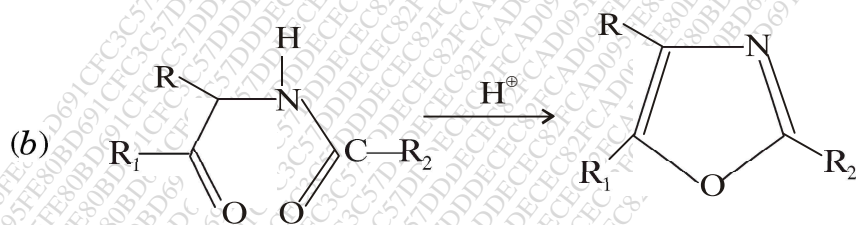
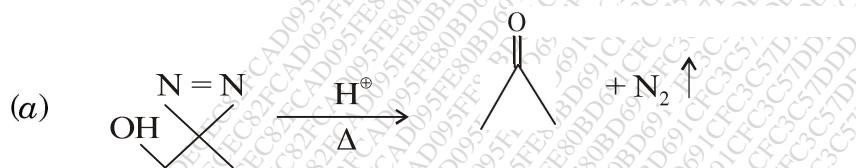


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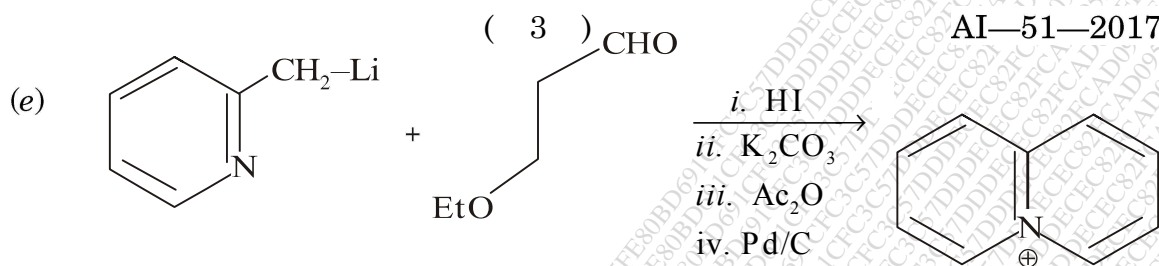


2. Suggest the mechanism for any *three* of the following :

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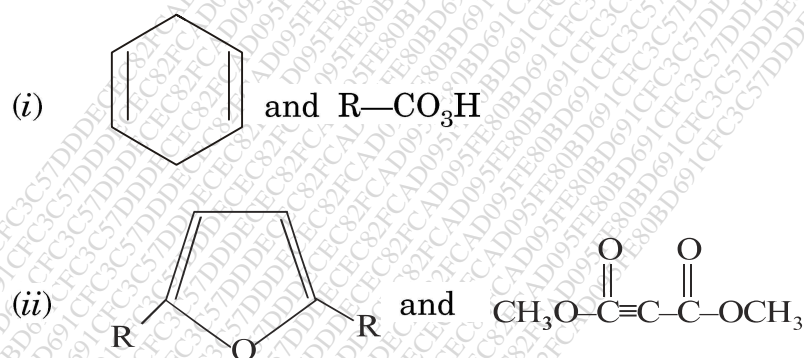
3. Solve the following :

(a) Explain the synthesis of thiirane from :

- (i) 2-mercaptoethanol and phosgene
- (ii) Epoxide and thiourea
- (iii) Epoxide and triphenyl phosphene sulfide

Or

Give the synthesis of oxepins from :



(b) Give the preparation of 1, 2, 5-Oxadiazole from :

- (i) Dioximes of 1, 2-dicarbonyl compounds
- (ii) Dimerisation of nitrile oxide
- (iii) Give the conversion of thioamides to 1, 2, 4-thiadiazole.

Or

How will you obtain benzothiazole from :

- (i) O-aminothiophenol and carboxylic acid
- (ii) N-aryl thioamides.

P.T.O.

4. Solve the following :

(a) What is the action of the following reagents on oxiranes. 8

- (i) C_6H_5MgBr
- (ii) $LiAlH_4$
- (iii) Dil. HCl and CH_3-OH .

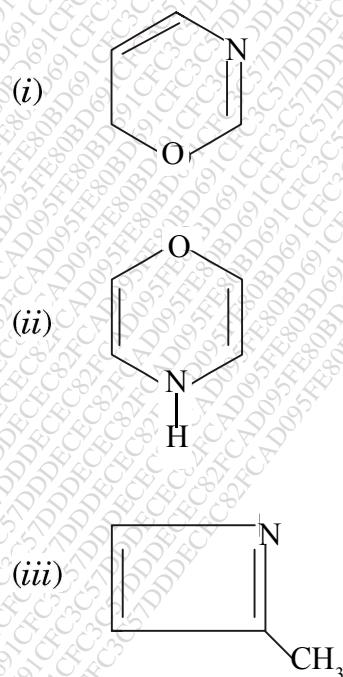
Or

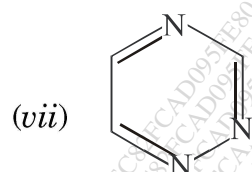
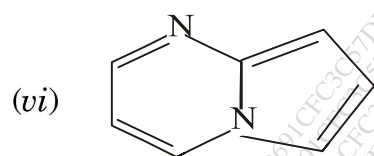
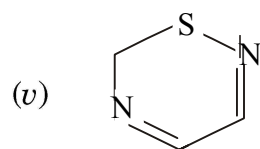
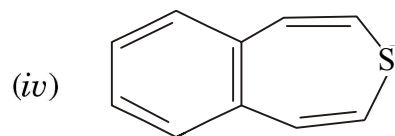
What is action of the following reagents on benzimidazole :

- (i) Formaldehyde and N, N-dimethylamine
 - (ii) Methyl bromide
 - (iii) Ethylene oxide.
- (b) How will you obtain pyrimidine from : 7
- (i) Malonic ester and urea
 - (ii) Acetylacetone and amidine
 - (iii) Acetophenone and formamide.

Or

Give the IUPAC names of the following heterocycles :



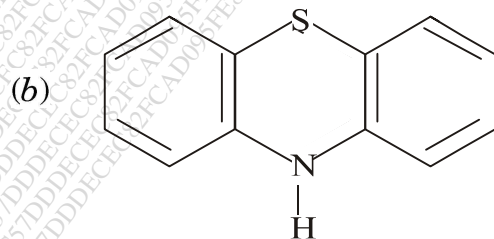
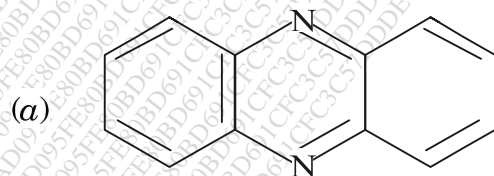


5. (A) Select the *correct* answer from the following multiple choice questions and rewrite answer. 5

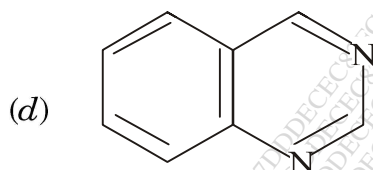
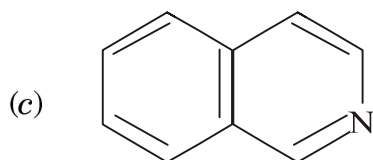
(1) Saturated nitrogen containing four membered ring is known as.....

- (a) azetane (b) aziridine
(c) azirane (d) azetidine

(2) Among the following which is phenazine ?



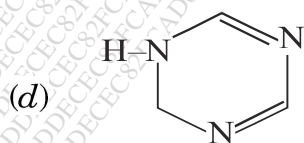
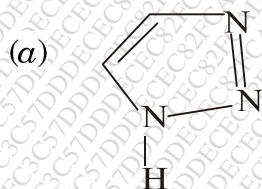
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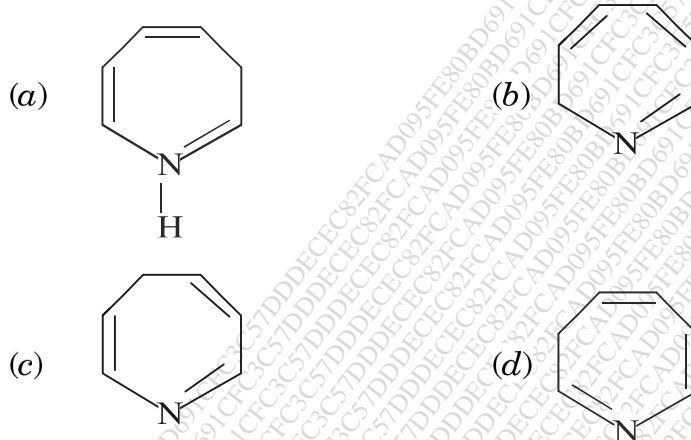
(3) Thiirane is also known as :

- (a) Ethylene sulfide (b) Episulfide
(c) Thiocyclopropane (d) All of these

(4) Among the following which is aromatic heterocycle ?



(5) The structure of 3H—azepine is :



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

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- (1) 1, 4-diazepines
- (2) Pyrazines
- (3) 1, 2, 3-triazines.