

This question paper contains 5 printed pages]

NY—47—2023

FACULTY OF SCIENCE

M.Sc. (Fourth Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

(New/CBCS Pattern)

ORGANIC CHEMISTRY

Paper-XX (OCH-521)

(Advance Heterocyclic Chemistry)

(Wednesday, 6-12-2023)

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

Time—3 Hours

Maximum Marks—75

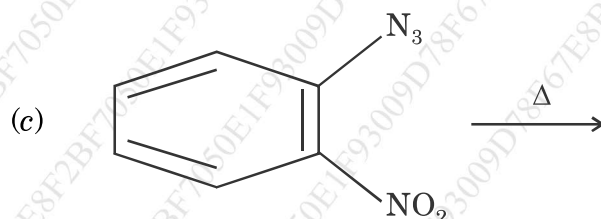
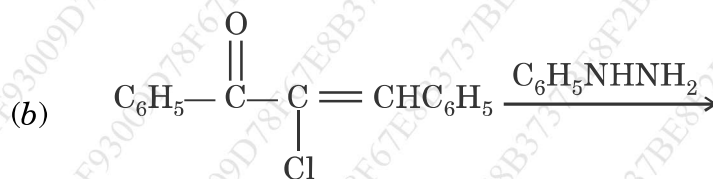
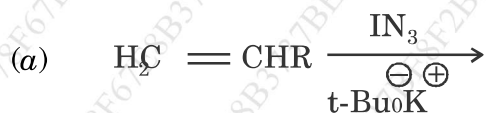
N.B. :- (1) Attempt *all* questions.

(2) Figures to the right indicate full marks.

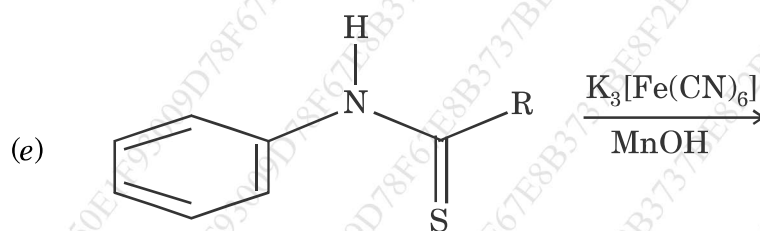
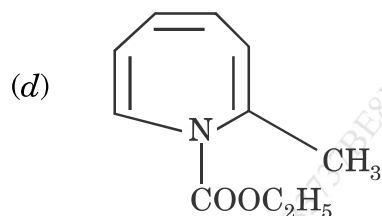
(3) Multiple to the right indicate full marks be attempted only once on page No. 3 of answer-book with complete answer.

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

15

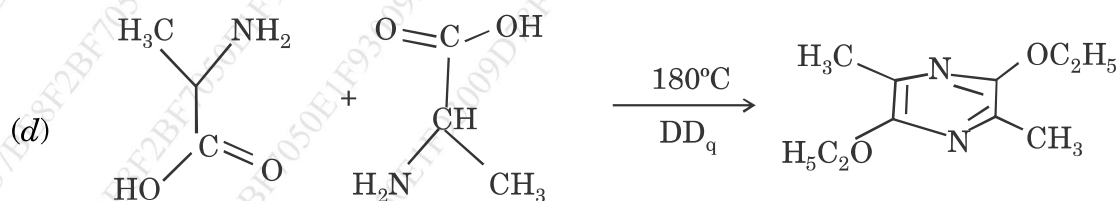
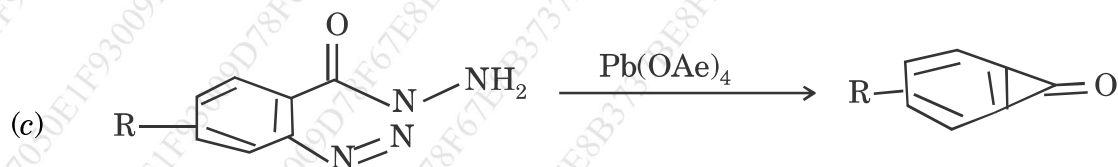
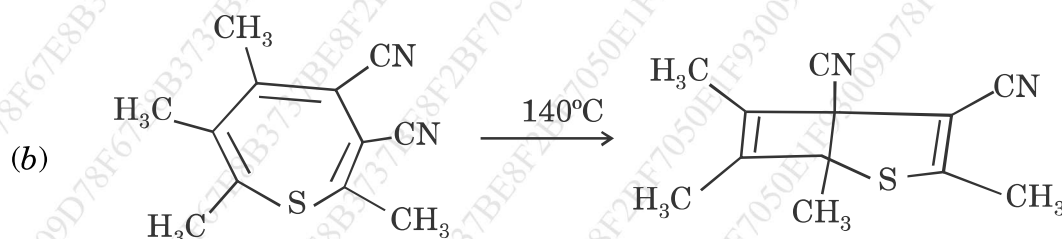
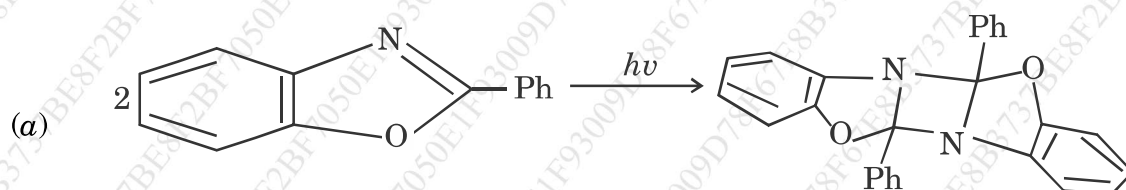


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2. Suggest the mechanism for any *three* of the following :

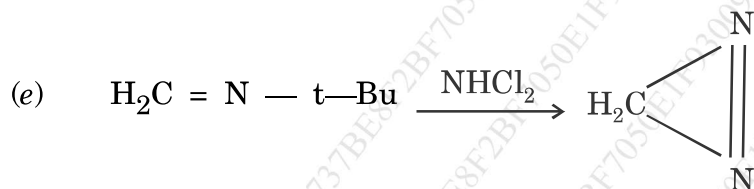
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(3)

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3. Solve the following :

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(a) Explain the synthesis of Azetidine from :

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(i) α -haloalkylamine

(ii) Aziridine.

Or

Explain the synthesis of Imidazole from :

(i) α -diketone with aldehyde in the presence of ammonia.

(ii) Amidine and α -haloketone.

(b) Explain the following chemical reaction of triazole :

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(i) With electrophilic reagents.

(ii) Dimroth rearrangement.

Or

Explain the following reactions of oxepin :

(i) Photochemical reaction

(ii) Reaction of 4-phenyl-1-benzoxepin with tetracyanoethylene.

4. Solve the following :

15

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

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Or

Explain the synthesis of quinolizinium 100 from :

- (i) 2-picolylithium and β -ethoxy propionaldehyde.
- (ii) 3-ethoxy propylmagnesium bromide and 2-cyanopyridine.

(b) Synthesis of Azocine :

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- (i) From diazabasketene
- (ii) From chlorosulfonyl isocyanate and 1, 4-cyclohexadiene.

Or

Synthesis of thiazole :

- (i) From α -halocarbonyl compound
- (ii) From Gabriel synthesis.

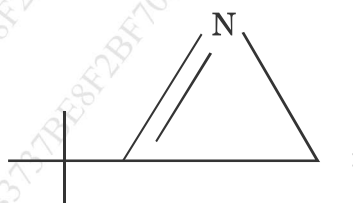
5. (A) Select the *correct* answer from the following multiple choice questions and rewrite answer :

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(i) Azocine is the aza analogue of :

- (a) Cyclooctatetraene
- (b) Cyclo-heptatetraene
- (c) Cyclo-hexatriene
- (d) Cyclo-pentadiene.

(ii) IUPAC name of compound



- (a) 3-t-Butyl-1-azirine
- (b) 2-t-Butyl-1-azirine
- (c) 1-t-Butyl-2-azirine
- (d) 1-t-Butyl-3-azirine

(iii) Pyrazoles are subject to electrophilic substitution and attack takes place at

- (a) 2-position
- (b) 3-position
- (c) 4-position
- (d) 5-position

(iv) Azonine is nine-membered ring compound containing

- (a) O
- (b) S
- (c) N
- (d) All of the above

(v) Diaziridine is compound containing two nitrogen atoms in a three membered ring.

- (a) Unsaturated
- (b) Saturated
- (c) Anionic
- (d) Cationic

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

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- (i) Azonine
- (ii) Indolizine
- (iii) Oxadiazole.