

8214-B

M.Sc. (Chemistry) IIIrd SEMESTER EXAMINATION, 2019

Paper - IV

CHEMISTRY OF HETEROCYCLIC COMPOUNDS

Time: Three Hours

Maximum Marks: 80

PART – A (खण्ड – अ)

[Marks: 20]

Answer all questions (50 words each).

All questions carry equal marks.

सभी प्रश्न अनिवार्य हैं। प्रत्येक प्रश्न का उत्तर 50 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – B (खण्ड – ब)

[Marks: 40]

Answer five questions (250 words each).

Selecting one from each unit. All questions carry equal marks.

प्रत्येक इकाई से एक-एक प्रश्न चुनते हुए, कुल पाँच प्रश्न कीजिए।

प्रत्येक प्रश्न का उत्तर 250 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – C (खण्ड – स)

[Marks: 20]

Answer any two questions (300 words each).

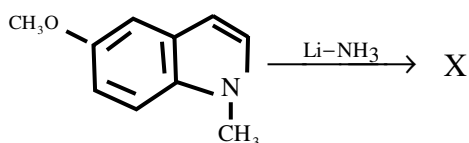
All questions carry equal marks.

कोई दो प्रश्न कीजिए। प्रत्येक प्रश्न का उत्तर 300 शब्दों से अधिक न हो।

सभी प्रश्नों के अंक समान हैं।

PART – A

- Q.1 (1) Define Dewar Resonance Energy. [2]
(2) Define Empirical Resonance Energy. [2]
(3) Write Gabriel Method (Reaction only) for preparation of Aziridines. [2]
(4) What will be the product when oxirane reacts with sulphur ylides? [2]
(5) Write the structure of Imidazole and Pyrazole. [2]
(6) Complete the reaction – [2]

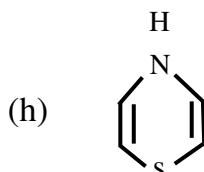
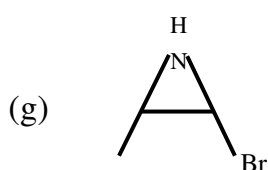
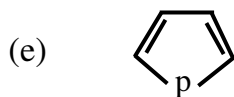
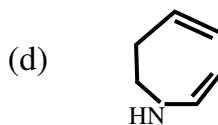
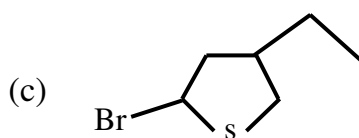
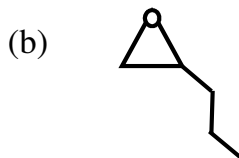
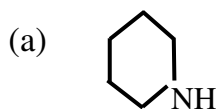


- (7) Define Pyrimidines and Pyrylium salts. [2]
(8) Write any two uses of Pyrazines. [2]
(9) Define Meso-Ionic Heterocycles with example. [2]
(10) Write the structure of 1,3 diazoliun-4-olates. [2]

PART – B

UNIT – I

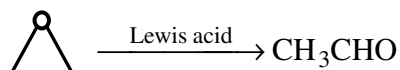
- Q.2 Write systematic nomenclature of the heterocycles given below – [1×8=8]



Q.3 Explain the criteria of aromaticity in heterocycles including Bond Length, Ring Current, chemical shift in $^1\text{H-NMR}$ spectra. [8]

UNIT -II

Q.4 Explain with full mechanism the reaction given below – [8]



Q.5 (a) Explain rearrangement reaction of Azetidine. [4]

(b) Explain one reaction of synthesis of Thietanes in detail. [4]

UNIT -III

Q.6 Write two synthetic methods and chemical properties of – [4+4=8]

(a) Thiazoles

(b) Furanes

Q.7 Write any two synthetic methods and chemical properties of – [4+4=8]

(a) Benzopyrroles

(b) Benzothiophenes

UNIT -IV

Q.8 Explain chemical properties of pyryllium salt and Acridines. [4+4=8]

Q.9 Explain chemical properties of Azepines and Diazepines. [4+4=8]

UNIT -V

Q.10 Take two examples of Meso-Ionic heterocycles and explain in detail. [8]

Q.11 Explain chemical properties of – [8]

(a) 1, 3 oxazolium-4-olates.

(b) 1, 3-diazolium-4-olates.

PART – C

Q.12 Explain replacement nomenclature of Monocyclic, Fused and Bridged heterocycles in detail with examples of each. [10]

Q.13 Discuss - [5+5=10]

- (a) Electrocyclic ring opening reaction of N-substituted aziridines.
- (b) Thermal Reaction of oxiranes.

Q.14 In detail explain synthesis and chemical properties of any two given below – [5+5=10]

- (a) Pyrroles
- (b) Thiophenes
- (c) Oxazoles
- (d) Pyrazoles
- (e) Imidazoles

Q.15 Write synthetic methods and chemical properties of any two given below – [5+5=10]

- (a) Pyrones
- (b) Quinolizinium salt
- (c) Triazines
- (d) Oxepines
- (e) Thiepines

Q.16 Explain in detail any two given below – [5+5=10]

- (a) Reaction of 1, 2, 3 Oxadiazolium 5-olates with Alkynes.
 - (b) Reaction of 1, 2-Dithiolium-4-olates with NH_3 and its derivatives.
 - (c) 1, 3 dipolar cycloaddition reactions of 1, 3 – Oxazolium – 4 – olates with Alkene.
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