PD-377 CV-19

(533) M.Sc. Chemistry (IIIrd Semester)

Examination Dec.-2020

CHEMISTRY OF HETEROYCLIC COMPOUNDS

Paper - IV

Time : Three Hours] **[Maximum Marks : 080**

[Minimum Pass Marks : 029

नोट : दोनों खण्डों से निर्देशानुसार उत्तर दीजिये। प्रश्नों के अंक उनके दाहिनी ओर अकित हैं।

Note : Answer from both the Section as directed. The figures in the right hand margin indicate marks.

SECTION-'A'

1. Answer the following questions:- [1 X 10 = 10]

   (a) Write the structural formula of AZACYCLOBUTADIENE?

   (b) Write the structural formula of 1, A - OXAZINE?

   (c) The 'N' atom in pyridine is-

   (i) Sp^3 hybridised (ii) Sp^2 hybridise (iii) Sp hybridised (iv) Cannot be predicted

   (d) Furaw reacts with ammonia in the presence of alumina at 400^0C to give-

   (i) Pyridine (ii) Furfural (iii) Pyrrole (iv) Furoic acid

   (e) Pyridine has a delocalized π - molecular orbital containing-

   (i) 4 - electrons (ii) 6 - electrons (iii) 8 - electrons (iv) 12 - electrons

   (f) Write the structural formula of COUMARIN.

   (g) Write the structural formula of 1, 8 – DIAMINNAPHTHALENE.

   (h) Write IUPAC name of 2, 4, 6 – COLLIDINE.

   (i) Write the structural formula of METHYL THIOPHENYL KETONE.

   (j) Write IUPAC name of INDOLE – 3 SULPHONIC ACID.

2. Answer the following questions:- [2 X 5 = 10]

   (a) Explain criteria of aromaticity in aromatic hetrocycles.

   (b) Discuss anomeric effect in the case of non-aromatic hetrocycles.

   (c) Give one synthesis of Oxitanes.

   (d) Give one synthesis of Thiazines.

   (e) Give synthesis of azepines from nitrobenzene.

SECTION-'B'

Answer all questions:- [12 X 5 = 60]

UNIT-I

3. Write short notes on the following:-

   (a) HANTZSCH – WIDMAN nomenclature for monocyclic compounds.

   (b) Nomenclature of bridged Hetrocycles.

"OR"

   (a) Describe the resonance energy in hetrocyclic compound.

   (b) Explain tautomerism in hetrocycles.

UNIT-II

4. Discuss the following:-

   (a) Bond angle strain.

   (b) Torsional energy barrier.

"OR"

Explain the following:-

(a) Stereoelectronic effect.

(b) Conformation of six member hetrocycles.

UNIT-III

5. Describe the **one** synthesis of **each** of the following compounds:-

   (a) AZIRIDINES

   (b) OXIRANE

   (c) THIRANE

   (d) AZETIDINE

"OR"

Discuss the basic principles of hetrocyclic synthesis involving cyclisation reactions and cycle addition reactions.

UNIT-IV

6. Discuss synthesis and reactions of pyrylium salts and pyroues.

"OR"

Give the synthesis and reactions of DIAZINES and TRIAZINES.

UNIT-V

7. Discuss the important chemical reactions of BENZOPYRROLE and Benzo-furans.

"OR"

Give the structure and reactions of the following:-

(a) THIEPINES

(b) DIAZEPINES

(c) THIAZEPINES