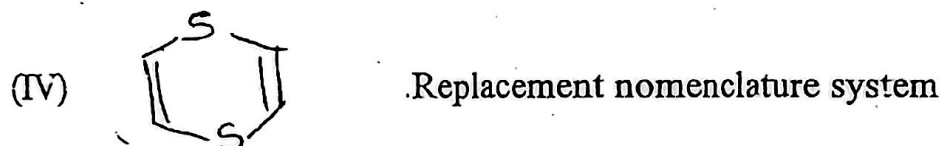
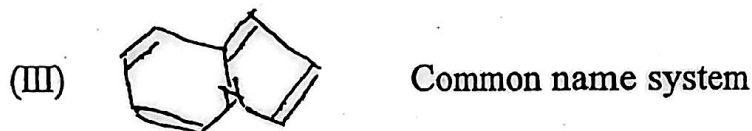
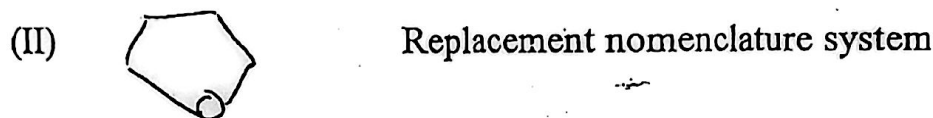
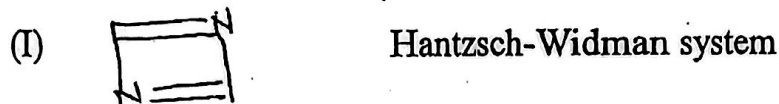


- N.B.** (1) All questions are compulsory.
 (2) Figures to the right indicate full marks.

1. (a) Attempt any two of the following :—

- (i) Name the following compounds according to the system of nomenclature mentioned alongside the structure :— 4

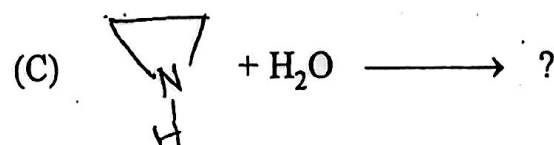
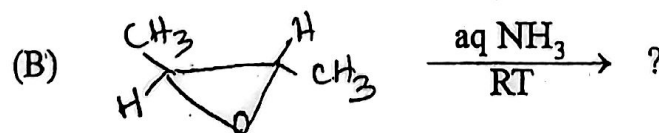
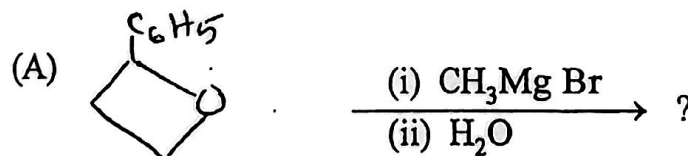


- (ii) Draw structures for the following :— 4

- (I) 1, 8 - diazanaphthalene
 (II) benzo [b] furan
 (III) 1-oxa-2-azacyclobut-2-ene
 (IV) thieno [2, 3 -b] furan

- (iii) (I) What are azetidines ? 4

- (II) Complete the following reactions :—

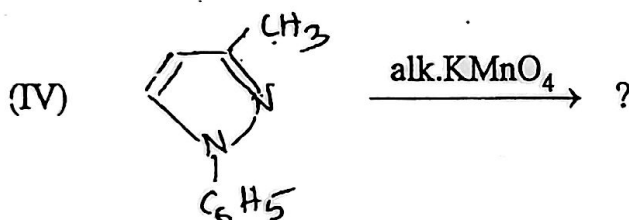
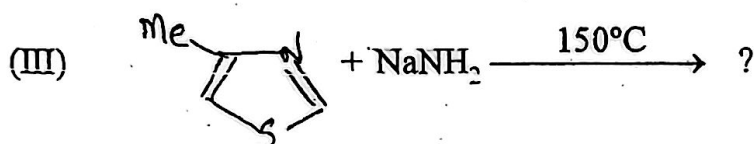
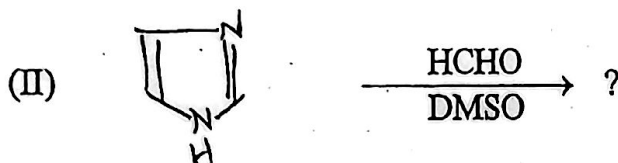
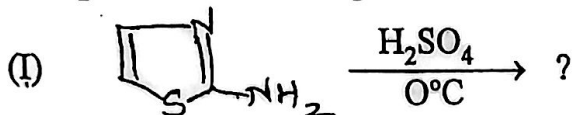


(iv) (I) Give the preparation of oxazoles from α -acylaminoketone by Robinson-Gabriel synthesis. 2

(II) Explain why electrophilic attack in 1, 2-azoles takes place at position 4. 2

(b) Attempt any one of the following :—

(i) Complete the following reactions :— 4



(ii) Discuss electrophilic attack at nitrogen and carbon atom of imidazole. 4

2. (a) Attempt any two of the following :—

(i) Explain the structural features and applications of starch and cellulose. 4

(ii) What are deoxy sugars and amino sugars? Write the structure of D-Glucosamine. 4

(iii) Discuss the oxidative degradation of β -carotene. 4

(iv) Give the synthesis of Grandisol from 2-methyl-1, 3-butadiene. 4

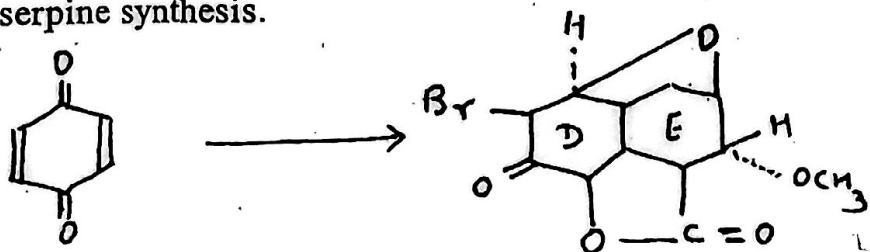
(b) Attempt any one of the following :—

(i) How will you prove the presence of the isoquinoline ring in papaverine? Write the structure of papaverine. 4

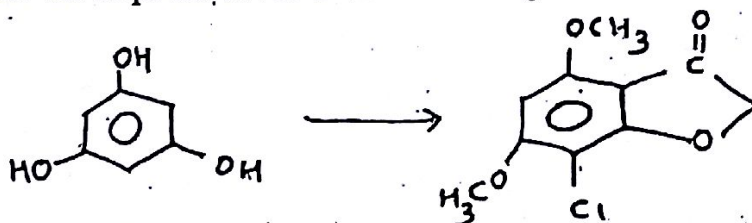
(ii) Give the structural features, occurrence, biological importance and applications of flavones. 4

3. (a) Attempt any two of the following :—

(i) Outline the steps involved in the following conversion as part of the Reserpine synthesis. 4



- (ii) Give the analytical evidence for the structure elucidation of PGE₁. 4
 (iii) Outline the steps involved in the following conversion :— 4



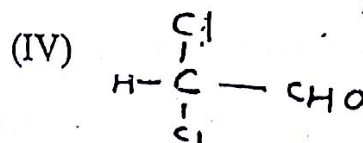
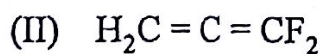
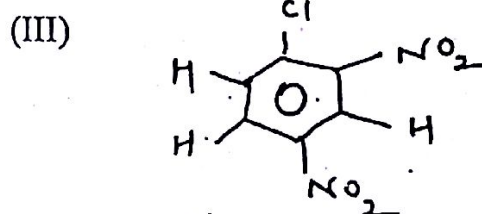
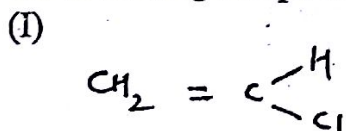
Draw the configuration of the two enantiomers of Griseofulvin.

- (iv) Write the synthesis of triacontanol. 4
 (b) Attempt any one of the following :—
 (i) (I) Draw the structure and state the biological importance of PGF₁α. 4
 (II) Draw the structure and give the application of Gibberelic acid.
 (ii) (I) Write the structure of β-Vetivone. 4
 (II) Give the preparation of



from acetone using E. Wenker's synthesis.

1. (a) Attempt any two of the following :—
 (i) Discuss the application of ³¹P and ¹⁹F NMR spectroscopy. 4
 (ii) What are Lanthanide Shift Reagents ? How are they useful in NMR spectroscopy ? 4
 (iii) Using Pople's spin system notation designate the type of spin system in the following compounds :— 4



- (iv) An organic compound with molecular formula C₅H₇NO₂ exhibits the following spectral data. Assign a suitable structure with justification. 4

IR (cm⁻¹) : 2260 (m)
 1747 (s)
 1200 (s)
 2900 (s)

¹H NMR δ (ppm) 1.3 (3H, t)
 3.5 (2H, s)
 4.3 (2H, q)

(b) Attempt any one of the following :—

(i) What is NOE ?

4

Discuss its importance in NMR spectroscopy.

(ii) Two organic compounds [A] and [B] having molecular formula $C_3H_6O_2$ exhibit strong absorption at 1735 cm^{-1} in their IR spectra.

4

Their 1H NMR data is as follows :—

Compound

Compound

[A] δ (ppm) : 2.7 (3H, s)

[B] δ (ppm) : 1.3 (3H, t)

3.7 (3H, s)

3.9 (2H, q)

8.0 (1H, s)

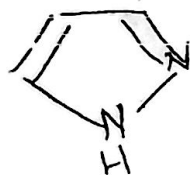
Deduce the structures for [A] and [B] with justification.

5. Attempt any four of the following :—

3

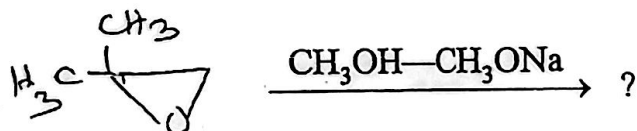
(a) Name the following compound by —

- (i) recognized common name
- (ii) systematic Hantzsch-Widman system
- (iii) replacement nomenclature.



(b) (i) Write the product formed :—

1



(ii) Discuss the photochemical conversion of isoxazoles to oxazoles.

2

(c) (i) What are branched sugars ?

1

(ii) Give the importance of insect pheromones.

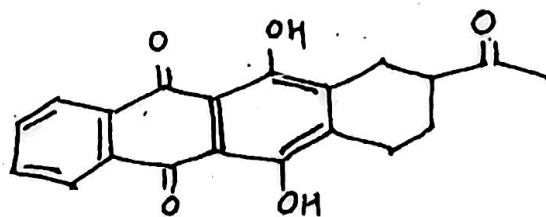
2

(d) Give the synthesis of ubiquinone from 3, 4, 5-trimethoxyacetophenone.

3

(e) In the following intermediate of 4-demethoxydaunomycin, how will you introduce -OH group at C - 9.

3



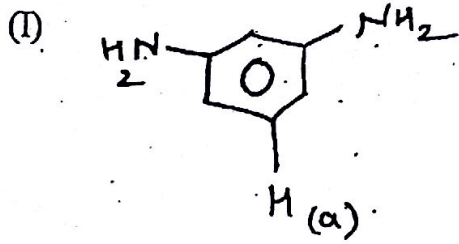
(f) Write a note on insect growth regulators.

3

(g) Discuss the principles and applications of FT-IR spectroscopy.

3

(h) Predict the splitting pattern for H_a protons in the following compounds :— 3



(III)

