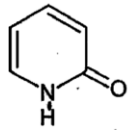
[Time: $2\frac{1}{2}$ Hours] **[Marks:60]**

Please check whether you have got the right question paper.

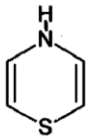
N.B: 1. All questions are compulsory.
2. Figures to right indicate full marks.

Q.1 a) Attempt **any two** of the following: **08**

i) Name the following compounds according to the system of nomenclature mentioned alongside the structure.



Hantzsch-Widman system



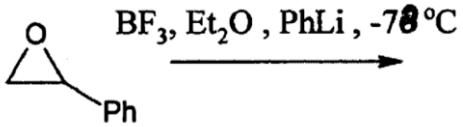
Replacement nomenclature

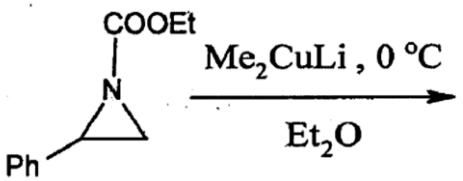
Replacement nomenclature

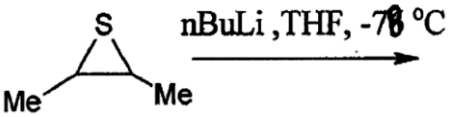
Common name

ii) Draw the structures of the following:
1) Thieno [2, 3-b] furan
2) dioxane
3) 4H-1, 4-benzothiazole
4) 2-azetidione

iii) I) Explain: Oxazole do not undergo nitration.
II) Complete the following reactions



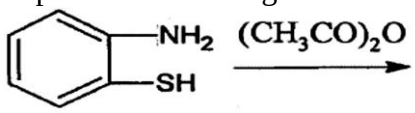


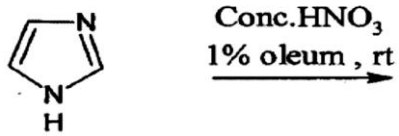


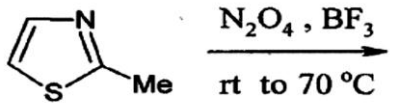
iv) Give the synthesis of oxazoles from α-diazo carbonyl compound and isocyanides.

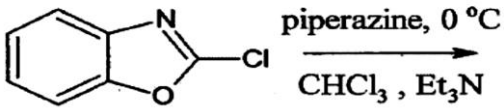
Q.1 b) Attempt **any one** of the following: **04**

i) I) Complete the following reactions.

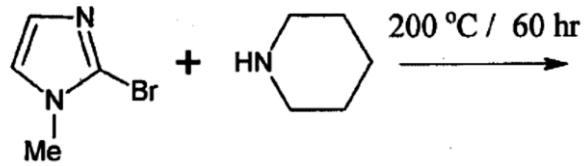


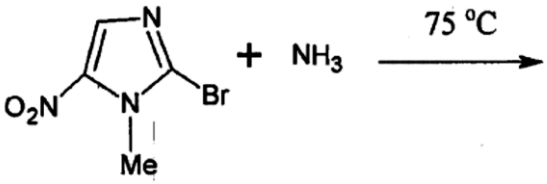






ii) I) give the synthesis of pyrazole from diazoalkane.
II) Complete the following reactions.





Q.2 a) Attempt **any two** of the following: **08**

i) Give analytical evidences in support of the constitution of β-carotene.

ii) Write notes on:
I) Deoxy sugars II) Amino sugars

iii) Explain the structural features and applications of
I) Starch II) Heparin

iv) Give the synthesis of grandisol from 2-methyl-1, 3-butadiene.

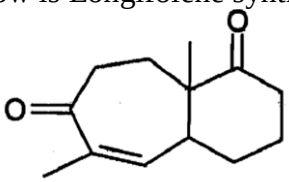
Q.2 b) Attempt **any one** of the following: **04**

i) What are insect pheromones? Discuss the various types of pheromones.

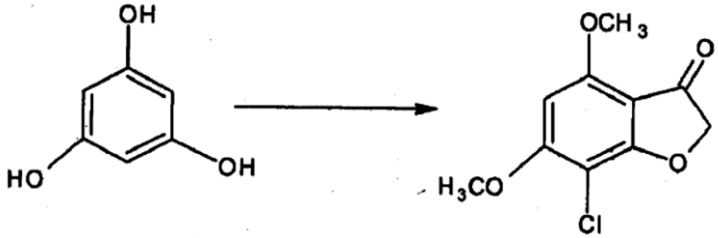
ii) Discuss oxidative studies of papverine.

Q.3 a) Attempt **any two** of the following: **08**

i) How is Longifolene syntheized from



ii) Outline the steps involved in the following.

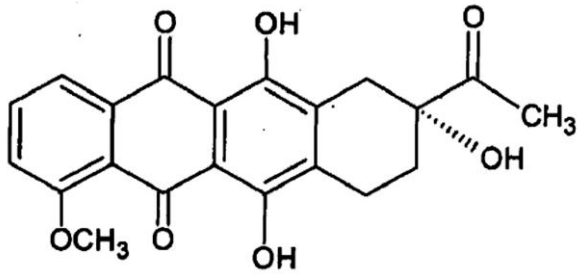


Write the structure of β-vetivone

iii) How would you convert 6-methoxytryptamine and cyclohexanecarboxaldehyde derivative into reserpine?

iv) Give the synthetic strategy for the synthesis of Longifolene.

How is 4-Demethoxydaunomycin synthesized from the following?



Q.3 b) Attempt **any one** of the following: **04**

i) What are prostaglandins? Give their classification and partial structures.

ii) Give analytical evidence for the structure elucidation of $PGF_1\alpha$.

Q.4 a) Attempt **any two** of the following: **08**

i) Draw the structures of the following compounds, label the protons and designate the spin system.

1) 1, 1, 2-trichloroethane 2) phenyl ethylacetate

3) 2, 5-dichloro nitrobenzene 4) vinyl acetate

ii) A compound having molecular formula $C_4H_9NO_2$ showed following spectral data

IR (cm^{-1}): 1690, 1620

^{1}HNMR: (δppm): 5.2(s, 1H), 1.2(t, 3H), 4.2(q, 2H), 1.3(d, 3H)

What is the structure of the compound?

iii) What do you understand by relaxation process in NMR? Explain its significance.

iv) When acetone is treated with a base product A is formed. The product showed the following spectral data

IR (cm^{-1}): 1695(s), 1620(m)

^{1}HNMR: (δppm): 1.9(s, 3H), 2.1(s, 6H), 6.0(s, 1H)

What is the structure of A?

Q.4 b) Attempt **any one** of the following: **04**

i) How will you distinguish between the compounds in each pair by IR spectra?

a) Cis and trans 2-butene

b) acetaldehyde and acetone

ii) A compound showed following spectral data

IR(cm^{-1}): 3000-2500(broad), 1715(s), 1342(w)

^{1}HNMR: (δppm): 2.12(s. 3H), 2.60(t, 2H), 2.25(t, 2H), 11.9(s, 1H)

Predict the structure of the compound.

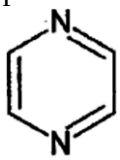
Q.5 Attempt **any four** of the following: **12**

a) Name the following compound by

i) Recognised common name

ii) Systematic Hantzsch – Widman system

iii) Replacement nomenclature



b) I) Explain: Azitidine is considerably stronger base than aziridine.

II) Give two example of nucleophilic substitution in thiazoles.

c) Write note on deoxysugars.

Give the importance of pheromones.

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

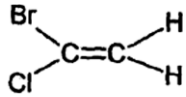
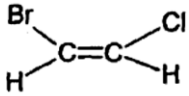
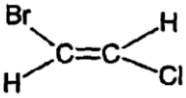
e) Draw the structure of JH_2.

Give a brief account of arylacetic acid as plant growth regulators.

f) Write structural features of gibberelic acids and give its applications.

g) Explain pulse sequence in FT – NMR spectroscopy.

h) Match the column and justify your answer.

A (compound)	B (J)
1) 	i) 6 - 12 Hz
2) 	ii) 12 - 18 Hz
3) 	iii) 0 - 3 Hz

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