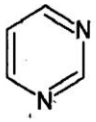
[Time: $2\frac{1}{2}$ Hours] **[Marks:60]**

Please check whether you have got the right question paper.

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

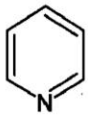
Q.1 a) Attempt **any two** of the following: **08**

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


Common name

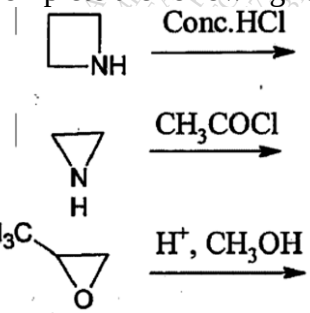

Hantzsch-Widman system


Hantzsch-Widman system


Replacement nomenclature

ii) Draw the structures of the following:
1) 1, 8-diazonaphthalene
2) 2H-1, 2-benzoxazine
3) 4H-furo [2.3-e]-1, 2-oxazine
4) 1, 2-Oxazetidine

iii) I) Explain: Aziridine is weaker base than Azitidine.
II) Complete the following reactions

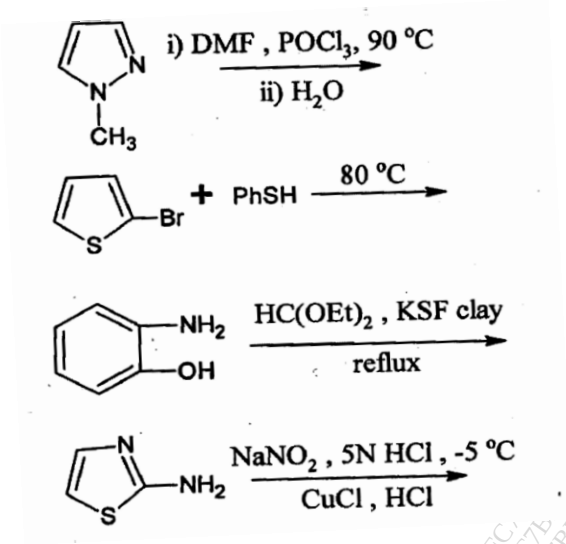


iv) Give the synthesis of imidazole from α-halocarbonyl compound and isocyanides.

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

i) I) Explain: Electrophilic substitution in imidazole at 2-position is unfavourable relative to attack at C-5.
II) Explain with suitable examples the reactivity of isoxazoles towards electrophiles.

ii) Complete the following reactions.



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

i) Discuss the oxidative studies of myo-inositol. **04**

ii) Explain the structural features and applications of **04**
I) Cellulose II) Heparin

iii) I) What are flavones? **01**

II) Draw the structure of β-carotene & give analytical evidence of **03**
A) the presence of conjugated double bonds.
B) the presence of two β-ionone units.
C) presence of bicyclic compounds.

iv) Give the synthesis of bombykol from acetylene. **04**

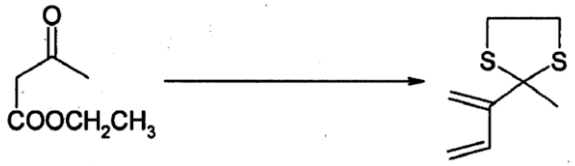
Q.2 b) Attempt **any one** of the following:

i) Give analytical evidence to prove the presence of the following in papaverine **04**
I) the presence of methylene group
II) four methoxy groups
III) isoquinoline unit and write the structure of papaverine

ii) Explain the structural features & biological importance of: **04**
I) anthocyanines
II) porphyrins

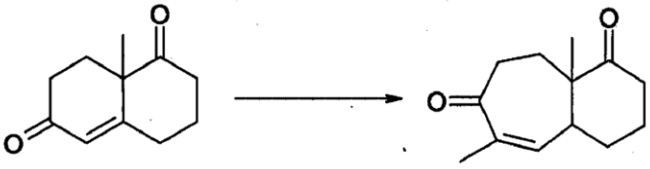
Q.3 a) Attempt **any two** of the following:

i) Give the synthetic strategy for the synthesis of reserpine. **04**
Outline the steps involved in the following conversion as part of 4-demethoxydaunomycin synthesis.

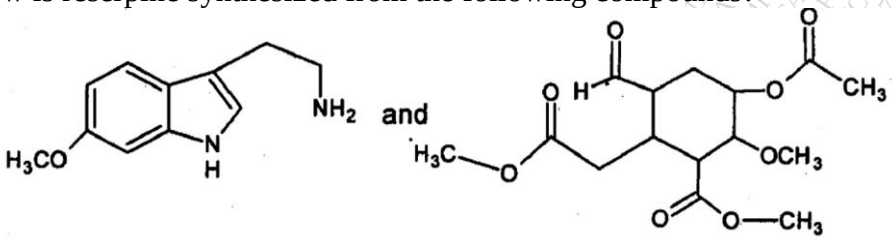


ii) Give the synthesis of Griseofulvin from phloroglucinol. **04**

iii) Outline the steps involved in the following conversion as part of Longifolene synthesis: **04**



iv) How is reserpine synthesized from the following compounds? **04**



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

i) Give the synthetic strategy for synthesis of Longifolene. **04**
Draw the structure of PGE_1 and give biological importance of prostaglandins.

ii) Give analytical evidence for the structure elucidation of $PGF_1\alpha$. **04**

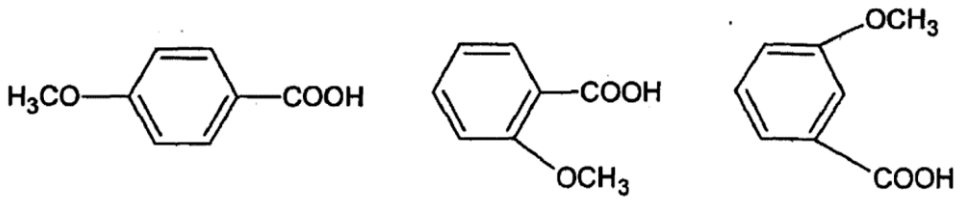
Q.4 a) Attempt **any two** of the following: **08**

i) What are chemical shift reagents?
What is the use of chemical shift reagent in simplification of complex spectra?

ii) Draw the structure of following compounds, label the protons and designate the spin system.
1) 2-bromo-5-cholrothiophene 2) 2, 3-dichloropyridine
3) Vinyl acetate 4) 5-nitro-m-xylene

iii) A compound having molecular formula $C_4H_5NO_2$ showed following spectral data
IR (cm^{-1}): 2250(m), 1740(s), 1240(s)
^{1}HNMR: (δppm): 3.8(s), 3.5(s), ratio 3:2
Assign the structure of the compound.

iv) Using ^{1}HNMR spectroscopy how will you distinguish among following isomers?



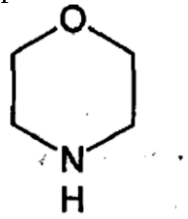
Q.4 b) Attempt **any one** of the following: **04**

i) Explain in brief ^{19}FNMR spectroscopy.
How can you distinguish between $FP(O)(OH)_2$ and $F_2P(O)(OH)$ by ^{31}PNMR?

ii) A compound having molecular formula $C_4H_8O_2$ showed following spectral data
IR(cm^{-1}): 1742(s), 1200(s)
^{1}HNMR: (δppm): 3.66(s, 3H), 2.32(q, 2H), 1.1(t, 3H)
Assign 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) Give two examples of nucleophilic substitution in thiazoles.
   II) Explain: Oxetane is considerably less reactive than Oxirane.

c) Give the synthesis of triacontanol.

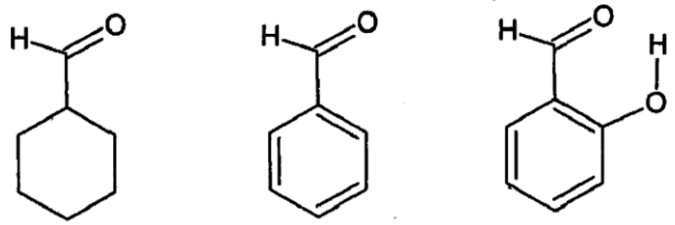
d) Give the synthesis of ubiquinone from 3, 4, 5-trimethoxyacetophenon.

e) Draw the structure of JH_2.
   Give a brief account of aryl acetic acid as plant growth regulators.

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

g) Explain NOE effect with two examples.

h) Predict the frequency shift of the carbonyl absorption in the IR spectra of the following aldehyde and justify your answer.



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