(2½ Hours) **(Total Marks : 60)**

Please check whether you have got the right question paper.

N.B.: **1)** Attempt **all the** questions.

2) **Figures** to the **right** indicate **full marks**.

1. **a)** Answer **any TWO** of the following : **(08)**

i) Give the occurrence, biological role and structural features of sterol.

ii) Write a note on steroidal hormones.

iii) Give the synthesis of 16-DPA from cholesterol.

iv) How is 16-DPA converted to Oestrone?

b) Answer **any ONE** of the following : **(04)**

i) Discuss the occurrence, biological role and structural features of corticosteroids.

ii) Give the synthesis of cinerolone. Give the structure of cortisole.

2. **a)** Answer **any TWO** of the following : **(08)**

i) Write the degradative evidences to establish structure of penicillin-G.

ii) How are the antibiotics classified based on their activity. Outline the steps involved in the synthesis of phenoxymethyl penicillin.

iii) How will you prepare Vitamin B_6 from ethoxy acetylacetone and cyano acetamide? Explain the biological importance of Vitamin B_6.

iv) Give the spectral data to establish the structure of chloramphenicol and give the synthesis of chloramphenicol from benzaldehyde and β-nitroethanol.

b) Answer **any ONE** of the following : **(04)**

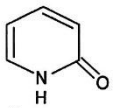
i) State the sources and biological importance of Vitamin B_{12}. Give the synthesis of Vitamin B_1.

ii) Provide evidence to prove that zingiberene is monocyclic and homoannular conjugated bond is present in the structure. Discuss the stereochemistry of zingiberene.

3. **a)** Answer **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) I) Give the synthesis of thiazole from α-halocarbonyl compounds.

II) Explain : Electrophilic substitution in imidazole at 2-position is unfavorable relative to attack at C-5.

iii) Explain : Electrophilic substitution in pyrazoles takes place at position 4. Justify your answer on the basis of stability of intermediates.

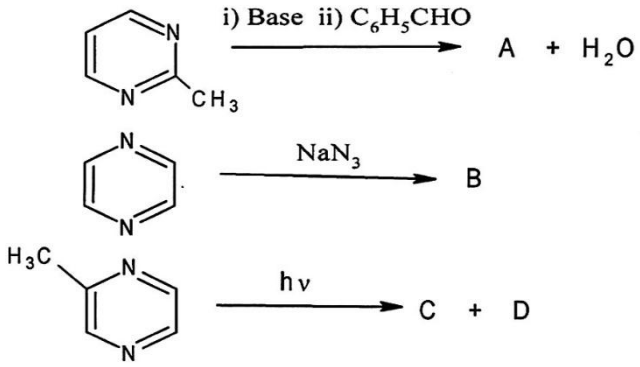
iv) I) How is pyrimidine synthesized from α, β-unsaturated ketones?

II) Explain : Pyridazine undergoes electrophilic substitution only under drastic conditions.

b) Answer **any ONE** of the following : **(04)**

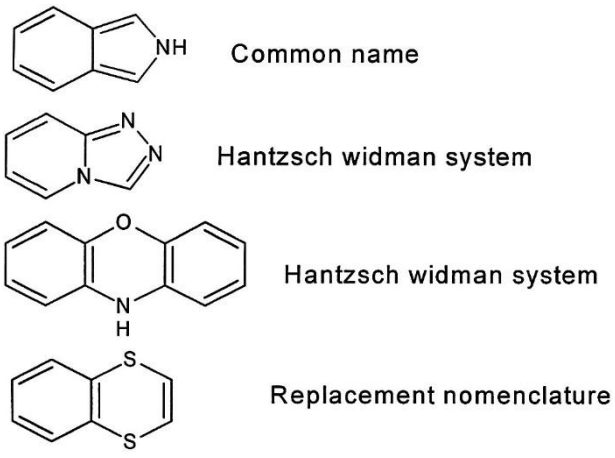
i) Draw the structures of the following compounds :
Pyrazin-2(3H)-one
Thiolane
1-oxa-3-azacyclopenta-2, 4-diene
2H-pyran

ii) Complete the following reactions by identifying A, B, C, D :



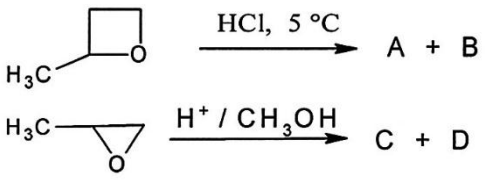
4. a) Answer **any TWO** of the following : **(08)**

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



ii) Give the following conversions :
Resorcinol to cormarin
2-aminophenol to benzoxazole.

iii) Complete the following reactions by identifying A, B, C, D :

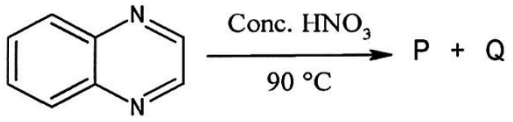


iv) I) Give synthesis of acridine from diphenylamine-2-carboxylic acid.
II) Explain : Nucleophilic substitution in acridine takes place at 9-position.

b) Answer **any ONE** of the following : **(04)**

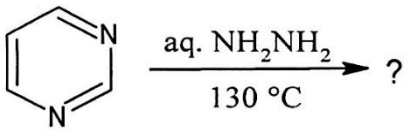
i) Draw the structures of the following:
4H-3, 1-benzoxazole
3, 9-diazaphenanthrene
1-oxa-4-thianaphthalene
Phenazine

iii) I) Give synthesis of purine from 4,5-diamino pyrimidine.
II) Complete the following reactions by identifying P, Q :

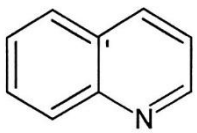


5. Answer **any Four** of the following : **(12)**

a) Give the synthesis of zingiberene.
b) How is 16-DPA converted to progesterone?
c) State the sources and biological properties of rotenoids. Draw the structure of rotenone.
d) Give the synthesis of muscone.
e) State whether the following statements are True or False & justify your answer :
i) Pyrazine has 'zero' dipole moment.
ii) Oxazines are aromatic in nature.
iii) 2-amino oxazoles cannot be diazotised.
f) Complete the following reaction and explain its mechanism :



g) Name the following compound by :
i) Recognized common name.
ii) Hantzsch widman system.
iii) Replacement nomenclature :



h) State whether the following statements are True or False & justify your answer :
i) Adenine is more basic than guanine.
ii) Oxiranes are less reactive than oxetanes.
iii) Benzo-1,3 and 1,2-azoles do not undergo electrophilic substitution in heterocyclic ring.
