(2 ½ hours) **Total Marks: 60**

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

Q.1 A Attempt **any Two** of the following: **8**

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

b. Give the synthesis of androsterone from 16-DPA.

c. Explain the following:

i) Give the reaction and role of Emine-Imine in the synthesis of oestrone.

ii) Write structural features and applications of steroidal hormones.

d. How is testosterone synthesized from 16-DPA?

Q.1 B Attempt **any One** of the following: **4**

a. Give the characteristics features and synthesis of any one sterol.

b. Give synthesis of 16-DPA from plant sapogenin.

Q.2 A Attempt **any Two** of the following: **8**

a. How are vitamins classified? Give synthesis of vitamin K and state its biological importance.

b. Give the sources and biological importance of vitamin B6.
Give the synthesis of vitamin B2.

c. Outline the synthesis of phenoxy methyl Penicillin including preparation of intermediate.

d. Give synthesis of Pyrethin-I.

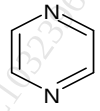
Q.2 B Attempt **any One** of the following: **4**

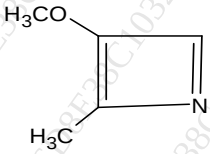
a. Give the spectral data to establish the structure of Chloramphenicol and give synthesis of Chloramphenicol from benzaldehyde and β-nitro ethanol.

b. Give the synthesis of zingiberene.

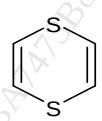
Q.3 A Answer **any Two** of the following: **8**

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

i  Common name system

ii  Hantzsch-Widman system

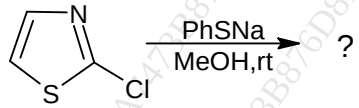
iii  Hantzsch-Widman system

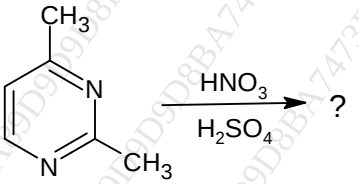
iv  Replacement

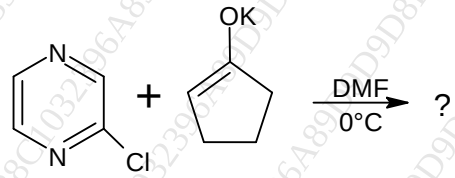
b. How would you synthesize following:
   i) Imidazole from Radiszewski method.
   ii) Thiazole from α-halo carbonyl compounds.

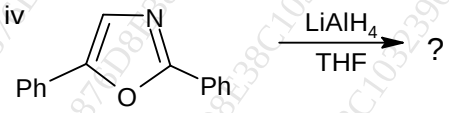
c. Explain: Electrophilic substitution in pyrazoles takes place at position 4. Justify your answer on the basis of stability of intermediates.

d. Complete the following reactions:

i 

ii 

iii 

iv 

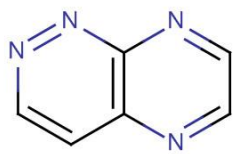
Q.3 B Attempt **any One** of the following: **4**

a. Draw structures for the following:
   i) 2H-1,3-Thiazine
   ii) 3,3-dimethylthietane
   iii) Pyrrolidine
   iv) Oxacyclohexa-2,5-diene

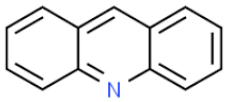
b. How will you carry out the following conversions?
   i) Oxazole to isothiazole
   ii) 1,2-diketone to pyrazine

Q.4 A Answer **any Two** of the following: **8**

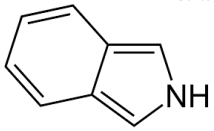
a. Name the following compounds according to the system of nomenclature mentioned under the structure.

(i) 

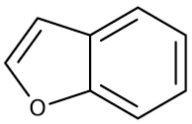
Hantzsch-Widman system

(ii) 

Replacement nomenclature



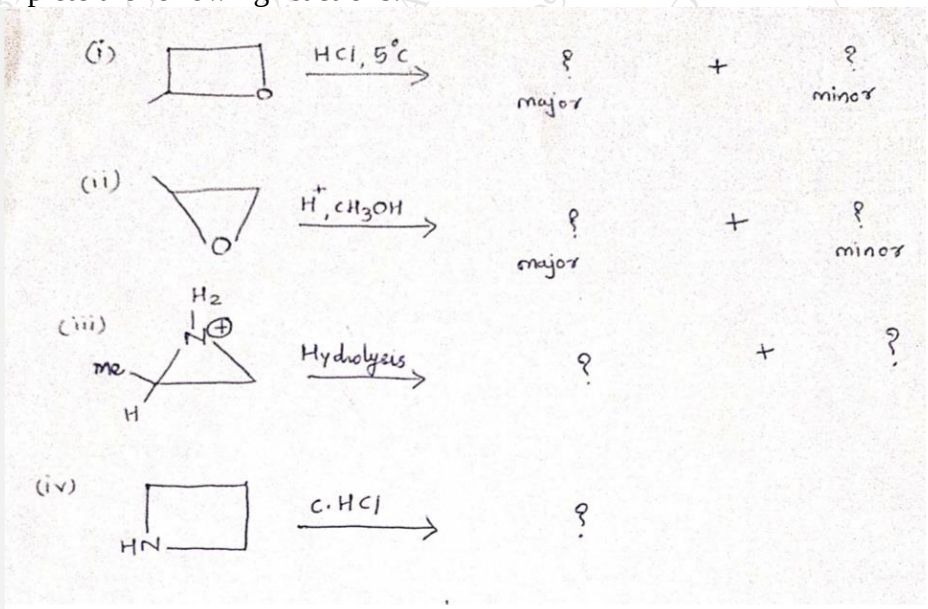
(iii) Common name

(iv) 

Hantzsch-Widman system

b. Give Traube synthesis of Purine and Pechmann synthesis of Coumarins.

c. Complete the following reactions:



d. Explain: (i) Adenine is more basic as compared to Guanine.
(ii) Oxetane ring is cleaved 10^3 times more slowly than Oxirane.

Q.4 B. Answer **any One** of the following: **4**

a. Draw the structures of the following compounds:

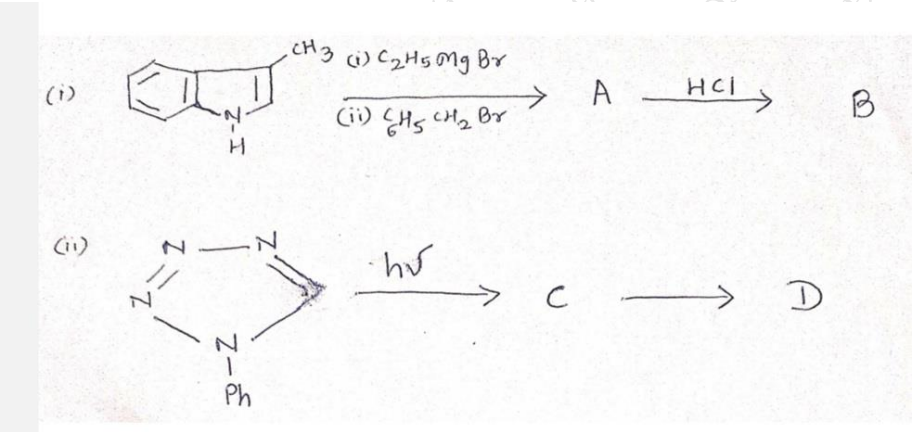
i) Quinoxaline

ii) Thieno[2,3-b]pyridine

iii) Benzo[c]pyridine

iv) 1-oxa-4-thianaphthalene

B Complete the following reactions:



Q.5 Answer **any Four** of the following: **12**

a. Give the synthesis of Allethrolone.

b. Give Synthesis of Exaltone from 3-methylthiophene.

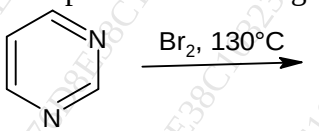
c. Give synthesis of Penicillin-G.

d. State the sources and biological properties of rotenoids.

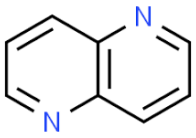
e. Illustrate with one example of bromination and nitration of isoxazole.

f. i) Explain: Pyrimidine is resistant to electrophilic substitution reactions.

ii) Complete the following reaction:



g. Name the following compound by



(i) Common name
(ii) Hantzsch-Widman system
(iii) Replacement nomenclature

h. Select the correct option:

i) Which of the following contains Benzo[g]pteridine nucleus?
a) Folic acid b) Ascorbic acid
c) Riboflavin d) Pyocyanine

ii) _____ group reduces the basicity of amino purines.
a) ester b) oxo
c) hydroxy d) cyano

iii) Which of the following is not a benzodiazine?
a) Cinnoline b) Quinoxaline
c) Quinazoline d) Quinolizine