

[2½ Hours]

[ Marks : 60]

Please check whether you have got the right question paper.

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

1. A. Attempt **any two** of the following : 8
  - i) Draw structure of testosterone. How is exaltone synthesized?
  - ii) Give occurrence, biological role and structural features of sterols.
  - iii) Give the synthesis of androsterone from 16-DPA.
  - iv) Discuss the occurrence, biological role and structural features of corticosteroids.
- B. Attempt **any one** of the following : 4
  - i) How is 16-DPA converted to oestrone?
  - ii) Give the synthesis of cinerolone. Give the structure of cortisol.
2. A. Attempt **any two** of the following : 8
  - i) Give synthesis of chloramphenicol from benzaldehyde and  $\beta$ -nitroethanol
  - ii) I) state the sources and biological importance of
    - a) Biotin      b) Vitamin K<sub>1</sub>
 II) Give synthesis of Vitamin K<sub>1</sub>
  - iii) Outline the synthesis of Zingiberine.
  - iv) Briefly describe the sources, biological importance and synthesis of Vitamin B<sub>6</sub> from ethyl ester of N-formyl-DL-alanine.
- B. Attempt **any one** of the following : 4
  - i) Outline the synthesis of Phenoxymethyl penicillin including synthesis of intermediates.
  - ii) Discuss the structure of Penicillin G based on its degradation studies.
3. A. Answer **any two** of the following : 10
  - i) Name the following compounds according to the system of nomenclature alongside the structure.



Common name



Hantzsch Widman system



Hantzsch Schmidtman system



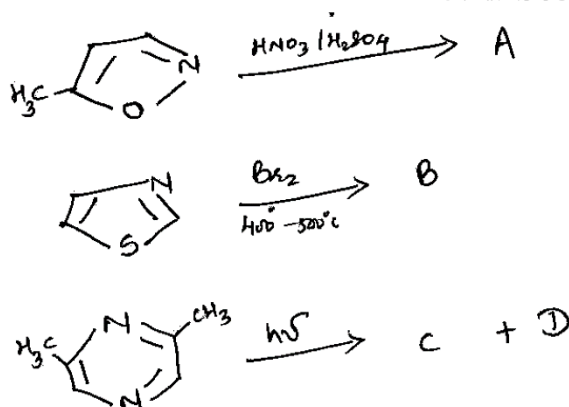
Replacement nomenclature

- ii) Draw the structures of the following
  - Azabenzene
  - Theitane
  - 1,2-diazole
  - Isoxazole

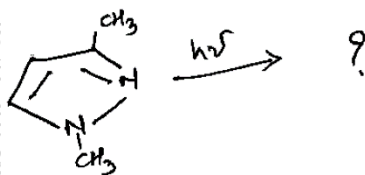
- iii) (I) Explain : Pyrazine has dipole moment zero however pyridazine has very high dipole moment of 4D.  
 (II) How is oxazole synthesized from isocyanides?  
 iv) (I) Explain: imidazole is more susceptible to electrophilic attack than pyrazole or thiazole.  
 (II) Gibe Hantzsch synthesis of thiazole.

B. Attempt **any one** of the following :

- i) Complete the following reactions :

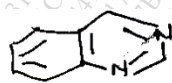


- ii) (I) Give synthesis of pyrazole from 1,3-dicarbonyl compounds and hydrazines.  
 (II) Complete the following reaction and explain its mechanism.



4. (A) Answer **any two** of the following:

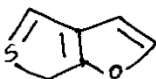
- i) Name the following compounds according to the system of nomenclature mentioned alongside the structure.



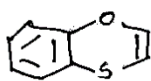
common name



Hantzsch Widman system

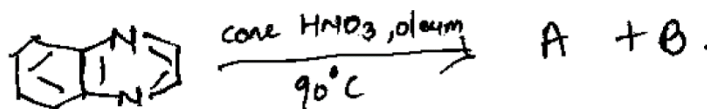


Hantzsch Widman system



Replacement nomenclature

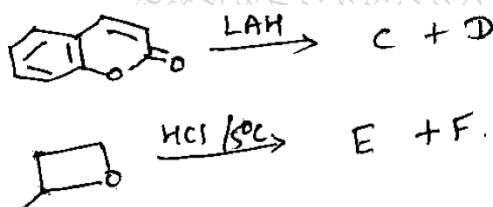
- ii) Draw the structures of the following  
 acridine  
 2H-furo [3,2-b] pyran  
 1,4-benzothiazine  
 2,5-diazaanthracene
- iii) (I) Give an account of nucleophilic ring opening reactions of aziridines.  
 (II) Give Traube synthesis of purines.
- iv) (I) Explain : Electrophilic attack on indole takes place at position 3  
 (II) Complete the following reaction.



B. Answer **any one** of the following questions.

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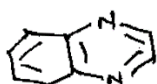
- i) Give following conversions.  
 (I) Resorcinol to coumarin  
 (II) 2-aminophenol to benzoxazole
- ii) Complete the following



5. Answer **any four** of the following :

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- How is 16-DPA synthesized from plant sapogenin?
- Give synthesis of Progesterone from 16-DPA
- How are vitamins classified? Draw structure of penicillin-G
- Give the synthesis of Pyrethrin-I
- State whether the following statements are true or false and justify your answer.
  - Oxazines are aromatic in nature.
  - Diazines are stronger base than pyridine.
  - Pyridazine has high boiling point as compared to pyrimidine and pyrazine
- Give an account of nucleophilic substitution in oxazoles
- What is the action of  $\text{Zn/HCl}$ ,  $\text{Li/NH}_3$  and  $\text{Pt/CH}_3\text{COOH}$  on indole?
- Name the following compound as per



Recognised common name,  
 Hantzsch-Widman system and  
 Replacement nomenclature.