

(2 Hours)

(Total Marks : 40)

N.B: (1) Question No. 1 is compulsory.

(2) Answer any four questions from the remaining six questions.

(3) Figures to the right indicate full marks.

1. Answer the following as directed (**Any Eight**) :

- Write the generic name and structure of a Nitrogen mustard anticancer agent
- Write the generic name and structure for:  
2-[2, 3-dichloro-4-(2-methylidenebutanoyl)phenoxy]acetic acid
- Give an example (with structure) of an anabolic steroid
- Give an example with structure of a second generation H1 antagonist
- Write the generic name and structure of a DNA polymerase Inhibitor
- Briefly describe the mechanism of action of Vincristine
- Give the chemical name and structure of a first generation sulfonyl urea
- Draw the structure of thiazide diuretic agent.
- Name the enzyme inhibited by Omeprazole
- Give an example of an amino ester class of local anesthetics

8

2. (a) Outline the synthesis of **any two** of the following with necessary reagents and appropriate reaction conditions :-

6

- Furosemide
- Lidocaine
- Cyclophosphamide

(b) Give the generic name, structure and use of an Antiestrogen.

2

3. (a) Give the structure of testosterone. Show numbering of the ring.

4

Comment on the changes in biological activity of testosterone by the following structural changes

- Oxidation of 17 $\beta$ -OH
- Fusion of the A-ring with pyrazole ring

(b) Classify local anesthetics giving one example (with structure) from each class.

4

4. (a) Answer in brief: 4
- i) Give the rationale for the development of second generation H1 antagonists
  - ii) Name the enzyme involved in the activation of 6-Mercaptopurine, and write the structure of the active form
- (b) Discuss the mechanism of action and SAR of the thiazolidinedione class of drugs used in diabetes 4
5. (a) Write a note on Anti-retroviral drugs 4
- (b) Classify the Anti-metabolite drugs used as antineoplastic agents giving one example (with structure) from each class 4
6. (a) Discuss the SAR and mechanism of action of sulfonyl urea class of hypoglycemic drugs with suitable examples 4
- (b) Complete the following reactions: 2
- i)  $3\alpha\text{-Methyl-}5\alpha\text{-cholestan-}3\alpha\text{-ol} \xrightarrow{\text{HClO}_4/\text{Acetic acid}}$
  - ii)  $2\text{-Cholestene} \xrightarrow{\text{Br}_2}$
- (c) Write the mechanism of action of Nevirapine 2
7. Write notes on (Any Two) 8
- (a) Proton pump inhibitors
  - (b) Antineoplastic antibiotics
  - (c) Site III diuretics