(2½ Hours)

[Total Marks: 60

N.B.: (1) All questions are compulsory.

(2) Figures to the right indicate maximum marks.

1. (a) Answer any two of the following :--

- (i) With respect to pharmacokinetics, discuss :-
 - (A) Drug distribution
 - (B) Drug elimination.
- (ii) Explain the terms :-
 - (A) Therapeutic index
 - (B) Drug receptors.
- (iii) How are 'leads' obtained, in medicinal chemistry?
- (iv) In the structure of 10-aminoalkylphenothiazine drug PROMAZINE given below, show how changes in chain-branching and homologation in the alkyl group brings about changes in the activity of the drug.

- (b) Attempt any one of the following:-
 - (i) What is bioavailability? How does lipophilicity and ionisation affect drug activity?
 - (ii) Explain how penicillin was discovered without a lead; give the structure of penicillin.
- 2. (a) Attempt any two of the following:-
 - (i) Discuss the role of DNA in the 'genetic code'.
 - (ii) In brief, give the functions of the different types of RNA.
 - (iii) Explain the H-Phosphonate method for the synthesis of oligonucleotides and give its advantage.
 - (iv) Give the relevant equations and explain the Edman degradation method for the sequencing of amino acids in a protein molecule.
 - (b) Attempt any one of the following:-
 - (i) Discuss the phophodiester method for the synthesis of oligonucleotides. What are its limitations?
 - (ii) Discuss the tertiary and quaternary structure of proteins.

QP Code: 08521

- 3. (a) Attempt any two of the following:-
 - (i) Give the six major classes of enzymes and their functions.
 - (ii) Explain enzyme specificity with respect to -
 - (A) Group specificity
 - (B) Linkage specificity.
 - (iii) What is inhibition of enzyme activity? Explain what is competitive inhibition.
 - (iv) Discuss the mechanism of chymotrypsin-catalyzed hydrolysis of a peptide bond.
 - (b) Attempt any one of the following:-
 - (i) Explain Fischer's Lock and Key model for the study of enzymatic activity.
 - (ii) How does substrate concentration affect the enzyme catalyzed reaction?
- 4. (a) Attempt any two of the following:-
 - (i) Explain acetate pathway.
 - (ii) How is mevalonic acid bisynthesized?
 - (iii) Give the general principles involved in the biosynthesis of steroids.
 - (iv) Give the biosynthesis of ephedrine.
 - (b) Attempt any one of the following:-
 - (i) How is shikimic acid biosynthesized?
 - (ii) Give the biosynthesis of citronellol from mevalonic acid.
- 5. Attempt any four of the following :-
 - (a) Explain why solubility is a very important factor in drug action.
 - (b) What is the relevance of structure activity relationship studies in 'lead modification'?
 - (c) Give the structure and importance of adenosine triphosphate.
 - (d) Write the structures of the four nucleosides in DNA and write the primary structure of the DNA molecule.
 - (e) Explain the role of acid-base catalysis in an enzymatic process.
 - (f) How does strain or distortion affect enzyme catalyzed reactions?
 - (g) Explain the following terms :-
 - (i) Biogenesis
 - (ii) Secondary metabolites.
 - (h) Give the general principles involved in the biosynthesis of amino acids.

* * * * * * * * *