QP Code : 26664

[2½ Hours] **[Total Marks : 60**

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

1. (a) Answer **any two** of the following :— **8**
   (i) Explain :-
   Therapeutic index and Drug receptor.
   (ii) Explain the terms :
   Drug distribution and Drug elimination with respect to pharmacokinetics.
   (iii) What is a lead compound ? How was penicillin discovered without a lead.
   (iv) Discuss 'bioisoterism' in detail.

   (b) Answer **any one** of the following :— **4**
   (i) Show how structure activity relationship studies are important for lead modification ?
   (ii) What is bioavailability ? How does lipophilicity and ionisation, affect drug activity ?

2. (a) Answer **any two** of the following :— **8**
   (i) Discuss the role of DNA in the 'genetic code'.
   (ii) Give the synthesis of oligonucleotides by using phosphoramidite method.
   (iii) Explain Edman degradation method for the sequencing of amino acids in a protein molecule.
   (iv) In brief give the functions of the different types of RNA.

   (b) Answer **any one** of the following :— **4**
   (i) Discuss the secondary structure of proteins.
   (ii) Explain the process of replication of DNA.

3. (a) Answer **any two** of the following :— **8**
   (i) Match the enzymes with their main class :

Enzyme	Main class
(I) Alcohol dehydrogenase	(A) Lyases
(II) Phosphorylase	(B) Oxidoreductases
(III) Lipases	(C) Hydrolases
(IV) Pyruvate decarboxylase	(D) Transferases
	(E) Ligases

   (ii) Explain : Irreversible inhibition of enzymes.
   (iii) Explain how the following parameters affect enzyme catalysis :
   pH and Product concentration.
   (iv) Discuss Fischer's 'Lock and Key' and Koshland's 'induced fit' hypothesis for enzymatic action.

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(b) Answer **any one** of the following :— **4**

(i) Discuss the mechanism of action of chymotrypsin.

(ii) Explain the following with reference to the mechanism of enzyme action strain or distortion and transition state theory.

4. (a) Answer **any two** of the following :— **8**

(i) Explain : Acetate pathway in biosynthesis.

(ii) Explain the general principles involved in the biosynthesis of steroids.

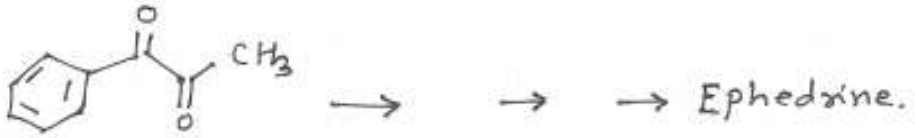
(iii) How is mevalonic acid biosynthesized ?

(iv) Give the biosynthesis of tryptophan from chorismate.

(b) Answer **any one** of the following :— **4**

(i) Give the biosynthesis of phenylalanine from chorismate and name the enzymes involved.

(ii) Give reactions for the following biosynthetic conversion.



Mention the importance of ephedrine.

5. Answer **any four** of the following :— **12**

(a) How is chain branching used in the structure modification of a lead for increasing potency ?

(b) Explain why solubility is a very important factor in drug action.

(c) Give the structure and importance of adenosine triphosphate.

(d) Give the H-phosphonate method for the synthesis of oligonucleotides.

(e) Explain how acid-base catalysis affets the mechanism of enzyme action.

(f) State the Michaelis-Menten equation for enzyme kinetics and explain the terms involved.

(g) Explain the terms,

Biogenesis and Biosynthesis

(h) Give the general principles involved in the biosynthesis of alkaloids.