M.Sc. sem. III repeater
April 2016
paper IV

**QP Code : 19743**

(2½ Hours) [ Total Marks : 60

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

1. (a) Answer any two of the following : 8
(i) Explain the following terms -
(I) Drug receptors
(II) Drug assay
(ii) What is the pharmacokinetics involved in -
(I) Drug elimination
(II) Bio-transformation
(iii) How was Librium discovered without a lead ?
(iv) What are 'lead' compounds in drug discovery ? Discuss any one method for obtaining leads.

(b) Answer any one of the following : 4
(i) Why is solubility an important parameter for drug distribution ?
(ii) How do 'chain branching' and 'ring chain transformations' affect drug activity ?

2. (a) Answer any two of the following : 8
(i) Give the functions of the three different RNAs.
(ii) Explain the secondary structure of proteins.
(iii) What is the H-phosphonate method from the synthesis of oligonucleotides.
(iv) Discuss the phosphoramidite process for the synthesis of oligonucleotides.

(b) Answer any one of the following : 4
(i) How does DNA control protein synthesis in the body ?
(ii) Discuss how the amino acid sequence in a protein is determined.

3. (a) Answer any two of the following : 8
(i) Discuss the effect of substrate concentration on enzymatic activity. Give the Michaelis-Menten equation and explain the terms involved in it.
(ii) What is enzyme inhibition ? Explain competitive inhibition, giving any one example.

TURN OVER

**OR-Con. 1156-16.**

(iii) Explain mechanism of enzyme action with reference to :
  (I) Fischer's lock and key theory.
  (II) Koshland's induced fit mechanism

(iv) Discuss the following in the mechanism of enzyme action.
  (I) Substrate strain
  (II) Covalent catalysis

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

(i) Explain how steric effect and orientation affect enzymatic activity.

(ii) Match the following enzymes with the main class :

| Enzyme | | Main class |
|---|---|---|
| (i) | Alcohol dehydrogenase | (A) Lyases |
| (ii) | Phosphorylase | (B) Oxidoreductases |
| (iii) | Lipases | (C) Transferases |
| (iv) | Pyruvate decarboxylase | (D) Hydrolases |
| | | (E) Isomerases |

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

(i) Give the biosynthesis of mevalonic acid.

(ii) Give the biosynthesis of squalene from isopentenyl pyrophosphate

(iii) Explain the general principles and the types of reactions involved in the biosynthesis of alkaloids.

(iv) Show how chorismate is biosynthesized from phosphoenol pyruvate and erythrose-4-phosphate.

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

(i) Give the biosynthesis of citronellol from mevalonic acid.

(ii) Starting from cinnamic acid, give the steps involved in biosynthesis of ephedrine.

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

(a) Explain the primary structure of RNA molecule

(b) Give the structure of ADP. What are its functions in the body ?

(c) Why is it important to study the 'structure-activity relationships' for drug design ?

(d) Discuss the term'bioavailability' with respect to a drug.

(e) Explain 'acid - base catalysis' in enzymatic activity.

(f) Explain how the rate of enzyme catalyzed reaction depends on pH.

(g) Explain the following terms :

(i) Precursors

(ii) Biogenesis

(h) Give the reactions for one cycle in the biosynthesis of saturated fatty acids starting from acetyl coenzyme-A.

---