M.Sc. Sem III April 2017 P-II

Organic Chemistry **Q.P. Code :04696**

[Time: 2½Hours] **[Marks:60]**

Please check whether you have got the right question paper.

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: (A) Therapeutic index
   (B) Drug potency
   (ii) How was penicillin discovered without a 'Lead'?
   (iii) Discuss the pharmacokinetics in drug metabolism and elimination.
   (iv) Explain physical and chemical parameters, solubility and partition coefficient in drug distribution and drug receptor binding.

   (b) Answer any **one** of the following:- 4
   (i) Explain how resonance and Inductive effect influence bioactivity?
   (ii) How is isomerism important in changing the level of drug distribution in the body?

2. (a) Answer any **two** of the following:- 8
   (i) How is oligonucleotide synthesized by phosphoramidite method?
   (ii) Write a note on the functions of m-RNA and r-RNA.
   (iii) Discuss the role of DNA with respect to the genetic code.
   (iv) Discuss the secondary structure of proteins.

   (b) Answer any **one** of the following:- 4
   (i) Explain the double helix structure of DNA.
   (ii) Explain phosphotriester method for the synthesis of oligonucleotides.

3. (a) Answer any **two** of the foliowing:- 8
   (i) What is the limitation of Fischer's 'lock and key' hypothesis? Explain 'induced fit' hypothesis.
   (ii) Discuss enzyme specifity.
   (iii) Explain the effect of the following on the catalytic activity of enzymes.
   (I) Temperature (II) Enzyme concentration
   (iv) Match the following enzymes with their major class.

Enzyme	Major class
(I) Alanine racemase	(A) Hydrolases
(II) Peptide synthetase	(B) Oxidoreductases
(III) Pepsin	(C) Ligases
(IV) Lactate dehydrogenase	(D) Isomerases

   (b) Answer any **one** of the following: 4
   (i) Explain: Catalytic efficiency of enzymes.
   (ii) Explain the effect of substrate concentration on enzymatic activity. Give Michaelis-Menten equation and explain the terms involved.

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

(i) Give the reaction, name the enzyme involved and mention the major class it belongs to, in the following biosynthetic transformations.

I. 5-Dehydroshikimate to shikimate

II. Shikimate to Shikimate-5-phosphate.

(ii) Explain the mevalonate pathway in the biosynthesis of natural products.

(iii) Discuss the general principles involved in the biosynthesis of amino acids.

(iv) Show how acetogenins are biosynthesized on the basis of acetate hypothesis.

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

(i) Give the biosynthesis of tryptophan from chorismate.

(ii) How is squalene converted to lanosterol in the biosynthesis of cholesterol? Explain the steps involved.

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

a) Explain the importance of structure activity relationship studies, in the modification of structure of a Lead.

b) How are chain branching and ring chain transformations used in the structure modification of a lead for increasing potency?

c) Give the structure and importance of ATP.

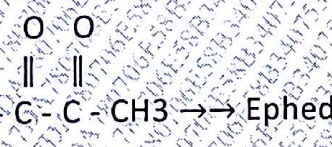
d) How is the sequence of aminoacids in a protein determined?

e) Explain the effect of pH on enzyme catalyzed reaction.

f) What is covalent catalysis in an enzymatic process?

g) Distinguish between primary and secondary metabolites.

h) Give reactions for the following biochemical conversion:



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