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S. No. of Question Paper : 5522

Unique Paper Code : 2492012401

Name of the Paper : Metabolism of Amino Acids and Nucleotides

Name of the Course : B.Sc. (Hons.) Biochemistry (NEP)

Semester : IV

Duration : 2 Hours

Maximum Marks : 60

(Write your Roll No. on the top immediately on receipt of this question paper.)

There are six questions.

Attempt any four questions.

All questions carry equal marks.

Question No. 1 is compulsory.

1. (A) Justify the following statements :

- (a) Alanine and glutamine are present in much higher concentrations than any other amino acids.
- (b) Nitrogen fixation is energetically expensive.
- (c) S-adenosyl methionine (SAM) has a higher methyl group transfer potential than N⁵-methyl tetrahydrofolate.

P.T.O.

(d) Branched chain amino acid metabolism is affected by Vitamin B12 deficiency.

(e) dATP is toxic to mammalian cells.

(f) Von Gierke's disease results in hyperuricemia.

(B) Give one significant contribution of the following scientists :

(i) P. Reicherd

(ii) A. Folling

(iii) John Buchanan. (12,3)

2. (A) Write down the role of pyridoxal phosphate in amino acid metabolism.

(B) Differentiate between the following :

(i) Transamination and oxidative deamination

(ii) Positive and negative nitrogen balance

(iii) Carbamyl phosphate synthetase I and II. (6,9)

3. (A) Explain the defective enzyme, biochemical basis and any *two* symptoms of the following metabolic disorders :

(a) Maple syrup urine disease

(b) Alkaptonuria

(c) Lesch Nyhan syndrome

(d) Gout.

(B) Elaborate on the mechanism of nitrogen fixation. (3×4,3)

4. (A) Discuss *four* major biosynthetic reactions which utilize PRPP.
- (B) Write the steps to accomplish the following conversion :
- (i) Methionine to cysteine
 - (ii) Tyrosine to norepinephrine
 - (iii) Glutamate to proline
 - (iv) dUMP to dTTP.
- (C) Explain Purine nucleotide cycle and its significance. (4,8,3)
5. (A) Give the reaction catalyzed by enzyme glutamine synthetase. Explain the regulation of glutamine synthetase by covalent modification.
- (B) List the mode of action of the following inhibitors :
- (a) Allopurinol
 - (b) 5-fluorouracil
 - (c) 6-mercaptopurine
 - (d) Trimethoprim. (7,8)
6. Write short notes on the following :
- (a) Liver as a 'metabolic hub' of our body
 - (b) Inherited defects of urea cycle
 - (c) Salvage pathway of nucleotide biosynthesis. (4,5,6)