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S. No. of Question Paper : **1824**

Unique Paper Code : **2493012005**

Name of the Paper : **Nutritional Biochemistry**

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

Semester : **IV (NEP)**

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 *four* questions in all. *All* questions carry equal marks.

Question No. **1** is compulsory.

1. (a) Discuss the following terms with respect to nutrition (any *five*) :

(i) RDA

(ii) Amino acid imbalance

(iii) Lipotropic factors

(iv) BMI

(v) Essential Fatty acid

(vi) Mutual Supplementation

P.T.O.

(b) Provide reasons for the following (any *five*) :

- (i) Iodine deficiency causes goiter.
- (ii) Meal composition affects the glycemic index.
- (iii) Pre-term infants given prophylactic doses of Vitamin-K.
- (iv) Pregnant women show positive nitrogen balance.
- (v) Consumption of hydrogenated and reheated oils is considered harmful.
- (vi) Respiratory quotient falls in diabetes mellitus. 5,10

2. (a) Explain the biochemical basis for the following :

- (i) Gamma-carboxylation by Vitamin K
- (ii) Actual bone rigidity in Fluoride Toxicity
- (iii) Heparin in iron homeostasis
- (iv) LPL and LCAT in lipoprotein metabolism
- (v) Deficiency of manganese leads to impaired skeletal growth

(b) Discuss the various nutritional indices used to assess the quality of dietary proteins and which amongst them is most preferred. 10,5

3. (a) Comment on the deficiency and clinical signs in the following cases :
- (i) Scurvy
 - (ii) Pellagra
 - (iii) Wilson's Diseases
 - (iv) Glossitis
 - (v) Keshan Disease
- (b) Define thermic effect of food. A boy consumed 2000 calories a day which comprised of 10% carbohydrates, 20% fats and 70% proteins; whereas his twin brother consumed the same number of calories but his macronutrient distribution was 20% fat, 20% protein and 60% carbohydrates. Would the energy required to digest the food vary in both the boys ? Give reason. 10,5
4. (a) Discuss the relationship between the following :
- (i) Trans fats and atherogenesis
 - (ii) Phosphate levels affect calcium homeostasis
 - (iii) Vitamin B6 requirement and dietary protein
 - (iv) Vitamin A and Night blindness
- (b) Name *two* copper containing ferro-oxidases. How does the copper deficiency lead to anemia ?
- (c) How does the B12 deficiency result in degeneration of nervous system ?

10,3,2

P.T.O.

5. (a) What is the role of dietary fiber in :

(i) Lipid metabolism

(ii) Colon health

(iii) Gastric emptying

(iv) Gut Microbiota

(b) What is Basal Metabolic Rate (BMR) ? Describe the factors that influence BMR.

(c) What is the biochemical basis for the development of rachitic rosary, bow legs and stunted growth in vitamin D deficiency in children ? How does vitamin D deficiency present differently in adults ?

8,4,3

6. Compare and contrast the following :

(i) Wet Beri-Beri and Dry Beri-Beri

(ii) Essential amino acids and non-essential amino acids

(iii) Chylomicrons and VLDL

(iv) Probiotics and Prebiotics

(v) Marasmus and Kwashiorkor

3×5=15