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MFN–002

MASTER OF SCIENCE (DIETETICS AND FOOD SERVICE MANAGEMENT)

M. SC. (DFSM)

Term-End Examination

December, 2023

MFN-002 : NUTRITIONAL BIOCHEMISTRY

Time : 2½ Hours *Maximum Marks : 75*

Note : (i) *Answer **five** questions in all.*

(ii) *Question No. **1** is compulsory.*

(iii) *All questions carry equal marks.*

1. (a) Explain the hydrogenation property/ reaction of fatty acid giving the chemical formula. 3

(b) How will you classify a sugar as 'D' or 'L' ? Explain giving the chemical formula. 3

(c) What is amino acid ? Give the general formula of amino acid. 3

(d) Give the structure and classification of nucleic acids. 1+2

(e) Differentiate between a cofactor and coenzyme. Give *one* example each. 3

2. (a) Differentiate between glycogenic and ketogenic amino acids. 2

(b) Illustrate the reactions involved in the removal of ammonia from our body. What is the process called ? 8

(c) Explain anapterolic reactions. 5

3. (a) What is oxidative phosphorylation ? How many ATPs are produced from $FADH_2$ and NADH ? 7

(b) What is citric acid cycle ? Give the reactions and enzymes involved in this reaction. 8

4. (a) What do you understand by the term hyperlipoproteinemia ? Present a brief review on the types of hyperlipoproteinemia. 2+6

(b) Highlight the four enzymes and the steps involved in the Beta-oxidation of fatty acid.

2+5

5. (a) How are purines synthesized by salvage pathway ? 7

(b) Give the role of free radicals in lipid peroxidation. 8

6. (a) "Vitamin D plays an active role in calcium metabolism." Justify the statement illustrating the role of Vitamin D in the pathway of calcium metabolism. 8

(b) Thiamin has a central role in energy yielding reactions of carbohydrate metabolism. Elaborate the function of thiamin giving the reactions where thiamin is involved. 7

7. (a) What is maple syrup urine disease (MSUD) ? Give the biochemical etiology (cause) of this disease. Comment on the beneficial diet therapy for this disease.

1+3+2

(b) Describe the composition of pancreatic juice and its role in digestion of food in the body. 5

(c) What is the effect of pH, temperature on enzyme activity ? Show graphically. 2+2

8. Write short notes on any ***three*** of the following : 5+5+5

(a) Visual Cycle

(b) Cholesterol Biosynthesis

(c) Fate of pyruvate

(d) Functions of gluconeogenesis

(e) Differentiate between ketosis and ketoacidosis.