

**MASTER OF SCIENCE (DIETETICS AND
FOOD SERVICE MANAGEMENT)**

Term-End Examination

June, 2010

MFN-002 : NUTRITIONAL BIOCHEMISTRY

03642

Time : 2½ hours

Maximum Marks : 75

Note : Answer four questions in all. Question No. 1 is compulsory.

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1. (a) Comment on the following statements : 10
- (i) Cysteine becomes an essential amino acid in homocystinuria.
 - (ii) Thyroid hormone receptors are present in the cell nucleus .
 - (iii) Copper is required for metabolism of iron.
 - (iv) Both mitochondrial and cytoplasmic systems are required for synthesis of urea.
 - (v) Oxygen free radicals have tissue damaging effects.
- (b) Differentiate between the following : 5
- (i) Synthesis and degradation of fatty acids.
 - (ii) Competitive and non-competitive enzyme inhibition

2. (a) Explain the phenomenon of isomerism with special reference to the following : 9
- (i) α and β anomers of fructose
 - (ii) cis and trans fatty acids
 - (iii) D and L galactose
- (b) Give the following chemical structures : 6
- (i) D-glucose
 - (ii) asparagine
 - (iii) 11-cis retinal
- (c) What do you understand by the following terms ? 5
- (i) Isozymes
 - (ii) Cori and alanine cycles
3. (a) The oxidative phase of HMP pathway is of great significance to the human cell. Explain the statement with the help of all the reactions constituting this phase. 10
- (b) What are the undesirable conditions produced when the following enzymes do not function in the body ? 10
- (i) glycine oxidase
 - (ii) carnitine palmitoyl transferase I
 - (iii) glucose-6- phosphatase
 - (iv) glutamine-synthetase
 - (v) orotate phosphoribosyl transferase.

4. (a) What are the general concepts of inborn errors of metabolism ? 6
- (b) Discuss the various types of thalassemias 8
- (c) In what ways do the following conditions differ ? 6
- (i) Andersen's disease and Forber's or Cori's disease
- (ii) Pentosuria and fructosuria
- (iii) Gaucher's disease and Niemann-Pick disease
5. (a) Give the reactions catalyzed by the following enzymes : 8
- (i) Thymidylate synthase
- (ii) Acetyl CoA carboxylase
- (iii) Aldolase A
- (iv) Methionine Synthase
- (b) Discuss the importance of Vitamin K in the body. 6
- (c) Describe the functions performed by zinc. 6
6. (a) Give the chemical reactions involved in the citric acid cycle. 15
- (b) What are the components of the electron transport chain which help in the oxidation of reducing equivalents produced in the citric acid cycle. 5

7. Write short notes on *any four* of the following : 20
- (a) Metabolism of VLDL
 - (b) Urea cycle
 - (c) Cholesterol biosynthesis.
 - (d) Digestion and absorption of proteins
 - (e) Biochemical role of insulin in the body.
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