MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – AUGUST 2011

SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)

Tuesday, August 16, 2011

Time: 10:20 – 13:00 Hrs.   Maximum Marks: 40

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1. Describe the reactions of β-oxidation of fatty acids. Give the biochemical basis for the occurrence of ketoacidosis during starvation.

                                                                (2+2 = 4 marks)

2. Discuss the formation and biological importance of specialized products formed from glycine and tyrosine.

                                                                (2+2 = 4 marks)

3. Describe the tricarboxylic acid cycle and explain its significance.

                                                                (2+1 = 3 marks)

4. With suitable examples, describe the primary, secondary and tertiary levels of structural organization of proteins.

                                                                (3 marks)

5A. Write the key reactions of gluconeogenesis pathway.
5B. Describe the regulation of glycogen metabolism.

                                                                (2+2 = 4 marks)

6. Write brief notes on the following:
6A. Digestion and absorption of dietary triacylglycerol.
6B. Effect of substrate concentration on enzyme activity.
6C. Structure and function of electron transport chain.

                                                                (2×3 = 6 marks)

7. Discuss the biochemical mechanisms responsible for the development of atherosclerosis.

                                                                (2 marks)

8. Discuss the clinical utility of the following:
8A. Glucose tolerance test
8B. Serum isoenzyme studies

                                                                (2×2 = 4 marks)

9. Briefly explain the following biochemical phenomenon:

9A. Competitive enzyme inhibition

9B. Transamination reaction

9C. Glucose absorption from the GI tract.

$(1\times3 = 3$ marks)

10. Describe the formation, transport and fate of ammonia in the body.

(3 marks)

11. Give the biochemical basis for the following:

11A. Chronic alcoholics tend to have high plasma VLDL levels.

11B. Pyruvate carboxylase deficiency can result in lactic acidemia.

11C. Long standing diabetes mellitus patients develop complications like retinopathy, nephropathy and neuropathy.

11D. Sickle cell hemoglobin forms long fibrous structures at low PO_2.

$(1\times4 = 4$ marks)

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FIRST MBBS DEGREE EXAMINATION – AUGUST 2011

SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)

Wednesday, August 17, 2011

Time: 10:20 – 13:00 Hrs.   Maximum Marks: 40

1.   Describe the process of translation with the help of neat labeled diagrams. Add a note on post-translational modifications.

(3+1 = 4 marks)

2.   With the help of a diagram, describe the salient structural features of Watson-Crick model of DNA.

(2 marks)

3.   Describe the heme biosynthesis pathway. Add a brief note on acute intermittent porphyria.

(3+1 = 4 marks)

4.   Discuss the metabolism of vitamin D under following headings:
4A. Formation of metabolic forms
4B. Biochemical functions
4C. Deficiency features

(1+2+1 = 4 marks)

5.   Explain regulation of gene expression in prokaryotes with lac-operon as a model.

(3 marks)

6.   Write brief notes on:
6A. Tumour markers
6B. Polymerase chain reaction
6C. Protein calorie malnutrition
6D. Metabolic acidosis

(1½×4 = 6 marks)

7.   Briefly answer the following:
7A. Major transport mechanisms across biomembranes
7B. Applications of radioisotopes in clinical medicine
7C. Biochemical assessment of liver function
7D. Metabolic functions of folic acid and B_{12}

(2×4 = 8 marks)

8. Discuss the role of protooncogenes and tumour suppressor genes in the process of human carcinogenesis.

(2 marks)

9. Give the biochemical basis for the following:
9A. Mutation of a codon need not result in alteration of amino acid sequence in the protein.
9B. A cancer patient undergoing radiation therapy develops severe pain in his right big toe.
9C. ELISA positive blood for HIV antibodies is further confirmed with Western blot analysis.
9D. Dietary fibers do not provide energy, yet they are important constituent of a balanced diet.

(1×4 = 4 marks)

10A. Name iron containing proteins and their functions.
10B. Explain absorption and transport of iron.

(1½+1½ = 3 marks)