

MANIPAL UNIVERSITY**FIRST MBBS DEGREE EXAMINATION – AUGUST 2009****SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)**

Monday, August 17, 2009

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 40

1. Classify amino acids based on their structure, nutritional requirement and metabolic fate. Give suitable examples.
(2+1+1 = 4 marks)
2. Explain the reactions of Citric acid cycle emphasizing energy yield and amphibolic use of intermediates. Add a note on anaplerotic reactions.
(4+1 = 5 marks)
3. Describe the ketogenesis and ketolysis pathway and explain its significance. Write a note on ketoacidosis.
(3+1 = 4 marks)
4. Give biochemical reasons for the following:
 - 4A. Both cellulose and starch are homopolysaccharides of glucose yet humans digest only starch.
 - 4B. Complete digestion of proteins requires several proteolytic enzymes in GI tract.
 - 4C. Although erythrose 4-phosphate is formed in the hexose monophosphate pathway; it is not accumulated in the cytosol of the cell.
 - 4D. Allopurinol treatment relieves the symptoms of hyperuricemia / gout.
 - 4E. Glucagon fails to produce hyperglycemic response in patients with type I glycogen storage disease.
(1×5 = 5 marks)
5. Write metabolic relationship between these compounds:
 - 5A. Cysteine and taurocholic acid
 - 5B. Glycine and creatine phosphate
 - 5C. Ornithine and spermidine
 - 5D. Serine and pyruvate
 - 5E. Carnitine and lysine
(1×5 = 5 marks)

6. How enzyme activities are regulated to effectively control metabolic pathways?
(3 marks)

7. Explain the role of adipose tissue in meeting the metabolic needs of the body.
(2 marks)

8. Mention the enzyme defects and metabolites accumulated / excreted in these diseases:

8A. Maple syrup urine disease.

8B. Refsum's disease.

8C. Niemann-Pick disease.

8D. Galactosemia.

(1×4 = 4 marks)

9. Write short notes on:

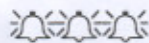
9A. Plasma albumin.

9B. High density lipoprotein.

9C. Heteropolysaccharides.

9D. High energy compounds.

(2×4 = 8 marks)



MANIPAL UNIVERSITY**FIRST MBBS DEGREE EXAMINATION – AUGUST 2009****SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)**

Tuesday, August 18, 2009

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 40

1. With the help of diagrams describe the process of transcription.
(3 marks)

2. Write the reactions involved in the synthesis of heme.
(3 marks)

3. Discuss vitamin D metabolism under the following aspects:
 - 3A. RDA and sources
 - 3B. Synthesis of active form
 - 3C. Role in serum calcium homeostasis(1+2+2 = 5 marks)

4. Give biochemical explanation for the following:
 - 4A. Fluorouracil is a chemotherapeutic agent
 - 4B. Deficiency of folic acid results in megaloblastic anemia
 - 4C. 61 codons code for 20 amino acids(1×3 = 3 marks)

5. Describe briefly the major steps involved in recombinant DNA technique.
(3 marks)

6. Write brief notes on:
 - 6A. Tumor markers
 - 6B. Watson Crick model of DNA
 - 6C. Point mutation
 - 6D. Absorption of iron
 - 6E. Nitrogen balance
 - 6F. Post translational modifications(8 marks)

7. Indicate the clinical significance of estimation and normal values of:

7A. Serum bilirubin

7B. Plasma creatinine

(1×2 = 2 marks)

8. Write the steps involved in degradation of purines. Mention any two causes for gout.

(3+1 = 4 marks)

9. Describe the salient features of fluid mosaic model of membrane.

(2 marks)

10. Discuss the structure and functions of transfer RNA(t-RNA).

(2 marks)

11. Compare the major features of following:

11A. Metabolic acidosis and respiratory acidosis.

11B. Kwashiorkor and Marasmus.

(1½×2 = 3 marks)

12. Briefly explain the biochemical mechanisms of carcinogenesis.

(2 marks)

