

MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

FIRST MBBS DEGREE EXAMINATION – MAY/JUNE 2006**SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)**

Monday, June 05, 2006

Time: 10:20 – 13:00 Hours.

Maximum Marks: 40

*✍ Illustrate your answers with diagrams and flow charts wherever appropriate**✍ Write brief, clear, relevant and legible answers*

1. Discuss the various levels of structural organisation of proteins. Add a note on denaturation.
(3+1 = 4 marks)
2. How is tyrosine synthesized in the human body? Give the catabolic pathway of tyrosine to show that it is both glucogenic and ketogenic.
(1+2 = 3 marks)
3. What are ketone bodies? Explain the reactions leading to their formation and utilization.
(4 marks)
4. Classify enzymes with one example to each group. Add a note on Michaelis constant.
(3+1 = 4 marks)
5. Give the electron transport chain components in order and show the ATP synthesizing sites across it.
(2+1 = 3 marks)
6. Give biochemical explanation for the following statements.
 - 6A. Cataract is seen in children suffering from galactosemia.
 - 6B. Defective synthesis of VLDL may result in fatty liver.
 - 6C. Proteolytic enzymes are secreted into the G.I. tract in inactive forms.
 - 6D. For the estimation of glucose, blood is collected in the fluoride containing tubes.(1×4 = 4 marks)
7. Describe glycogen metabolism. Add a note on its regulation by glucagon.
(3+1 = 4 marks)

8. Write the reactions catalysed by following enzymes.

8A. HMG CoA reductase

8B. Glutamate decarboxylase

8C. Succinate thiokinase

8D. Aldolase

($\frac{1}{2} \times 4 = 2$ marks)

9. Write the composition of:

9A. Cerebroside

9B. Glutathione

9C. Hyaluronic acid

9D. Lecithin

($\frac{1}{2} \times 4 = 2$ marks)

10. Write brief notes on:

10A. Allosteric enzymes

10B. Bile salts

10C. Cyclic AMP

10D. Cori's cycle

($1\frac{1}{2} \times 4 = 6$ marks)

11. Write the metabolic importance of pyruvate in the body.

(2 marks)

12. Explain the role of lipoproteins in the transport of lipids.

(2 marks)

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FIRST MBBS DEGREE EXAMINATION – MAY/JUNE 2006

SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)

Tuesday, June 06, 2006

Time: 10:20–13:00 Hours

Maximum Marks: 40

- ✍ *Illustrate your answers with diagrams and flow charts wherever appropriate*
 ✍ *Write brief, clear, relevant and legible answers*

- 1A. Explain purine salvage pathway.
 1B. Name the disease condition characterized by block in this pathway and explain its biochemical features.
 1C. With a neat diagram indicate the sources of different atoms of purine ring. (2+2+1 = 5 marks)
- 2A. Define 'translation'. Describe the various steps of translation.
 2B. Name four inhibitors of translation. (3+1 = 4 marks)
- 3A. Define 'recombinant DNA'. How is it prepared?
 3B. Write applications of recombinant DNA technology. (2+2 = 4 marks)
- 4A. What is Restriction Fragment Length Polymorphism? Write its applications.
 4B. Explain Southern blotting technique. (2+2 = 4 marks)
5. Explain semi-conservative replication of DNA. (4 marks)
6. Explain different types of membrane transport systems with one example to each. (3 marks)
- 7A. What are porphyrias? How are they classified?
 7B. Explain symptoms and biochemical defects in acute intermittent porphyria. (1+2 = 3 marks)
- 8A. Name iron containing proteins and their functions.
 8B. Explain absorption and transport of iron. (2+3 = 5 marks)
- 9A. Explain 'biological value' of proteins. What is daily requirement of proteins?
 9B. Write a brief note on Protein calorie malnutrition. (2+2 = 4 marks)
- 10A. Define 'xenobiotics'. Name different types of reactions they undergo in our body with one example to each.
 10B. Explain the clinical utility of estimation of serum bilirubin levels. (2+2 = 4 marks)



MANIPAL ACADEMY OF HIGHER EDUCATION

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FIRST MBBS DEGREE EXAMINATION – AUGUST 2006**SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)**

Wednesday, August 16, 2006

Time: 10:20 – 13:00 Hours.

Maximum Marks: 40

- ✍ Illustrate your answers with diagrams and flow charts wherever appropriate.
✍ Write brief, clear, relevant and legible answers.

1. Describe the de novo synthesis of fatty acids. Discuss the role of citrate in this process.
(5+1 = 6 marks)
2. Describe the chemistry and functions of any two mucopolysaccharides.
(3 marks)
3. Write the biochemical basis for any two manifestations in Von Gierkes' disease.
(2 marks)
4. Write the similarities and differences between phospholipids and glycolipids.
(2 marks)
5. Describe the features of active site of an enzyme.
(2 marks)
6. Describe the structure and function of LDL with a labelled diagram.
(3 marks)
7. Give reasons for the following:
 - 7A. Glucokinase phosphorylates glucose only, when the blood glucose level is high.
 - 7B. Lovastatin is used in the treatment of hypercholesterolemia.
 - 7C. Hypoglycemia is not observed in patients with Mc Ardle's syndrome.(3 marks)
8. Discuss the metabolism of sulfur containing amino acids under:
 - 8A. Formation of cysteine from methionine.
 - 8B. Role of S-adenosyl methionine (SAM).
 - 8C. Specialized products from cysteine.

(3+2+2 = 7 marks)

9. "Citric acid cycle is the final common pathway of metabolism". Explain.

(2 marks)

10. Fatty liver is observed in patients with Kwashiorkor. Explain the biochemical basis.

(2 marks)

11. With suitable examples give the similarities and differences of action of an inhibitor and uncoupler in the electron transport chain.

(2 marks)

12. Give reasons for the following:

12A. Free fatty acid levels are raised during starvation.

12B. Oxidation of succinate yields only 2 ATP.

12C. Thiamine requirement is higher in persons consuming a high carbohydrate diet.

(3 marks)

13. Describe digestion and absorption of dietary starch.

(2+1 = 3 marks)

MANIPAL ACADEMY OF HIGHER EDUCATION

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FIRST MBBS DEGREE EXAMINATION –AUGUST 2006**SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)**

Thursday, August 17, 2006

Time: 10:20–13:00 Hours

Maximum Marks: 40

- ✍ **Illustrate your answers with diagrams and flow charts wherever appropriate**
✍ **Write brief, clear, relevant and legible answers**

1. Describe the formation, transport and disposal of bilirubin. Add a note on Van den Bergh test and its clinical significance.

(3+1 = 4 marks)

2. Explain the process of translation with reference to: a) Chain initiation b) Chain elongation.

(2+2 = 4 marks)

3. Name the coenzymic forms of thiamine and pyridoxine. Write one reaction for each to show their participation in biochemical reactions.

(2 marks)

4. Describe briefly the major steps of recombinant DNA technology.

(3 marks)

5. Describe the double helical structure of DNA.

(3 marks)

6. Explain the role of cytochrome P-450 in detoxification.

(2 marks)

7. Write notes on:

7A. Transport across membrane.

7B. Calcitriol.

7C. DNA repair.

7D. Restriction fragment length polymorphism.

(2×4 = 8 marks)

8. Give the biochemical explanation for the following statements:

8A. Delay in wound healing is observed in vitamin C deficiency.

8B. Respiratory quotient is lower in starved subjects.

8C. Anion gap is increased in uncontrolled diabetes mellitus.

8D. Requirement of vitamin E is proportionate to the dietary intake of PUFA.

(1×4 = 4 marks)

9. Write the biochemical defects in:

9A. Lesch Nyhan syndrome.

9B. Orotic aciduria.

9C. Dubin Johnson's syndrome.

9D. Wilson's disease.

(½×4 = 2 marks)

10. Explain the absorption, transport and storage of iron in the body.

(2+1+1 = 4 marks)

11. Write a note on operon model of gene regulation.

(2 marks)

12. Describe briefly the purine salvage pathway.

(2 marks)