

**MANIPAL UNIVERSITY****FIRST MBBS DEGREE EXAMINATION – MAY/ JUNE 2011****SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)**

Monday, June 06, 2011

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 40

1. Explain reactions of glycogenesis and glycogenolysis. Describe importance of them in the blood glucose regulation.  
(3+1 = 4 marks)
2. Describe metabolism of sulfur containing amino acids in humans. Add notes on the inborn errors associated with this metabolism.  
(3 marks)
3. Explain de novo synthesis of fatty acids. Name the sources of NADPH for this pathway.  
(3 marks)
4. Explain specificity of enzyme towards substrate and reaction with appropriate examples.  
(2 marks)
5. Describe metabolic changes associated with starvation.  
(2 marks)
6. Uncouplers of oxidative phosphorylation and respiratory chain inhibitors differ in their action. Explain with examples.  
(2 marks)
7. Many drugs used in the treatment of diseases are competitive inhibitors of enzymes. Justify this statement with at least two examples.  
(1 mark)
8. **Write short notes on the following:**
  - 8A. Formation and function of 2, 3-Bis Phosphoglycerate
  - 8B. Role of co-enzymes
  - 8C. Synthesis of bile salts and role in digestion
  - 8D. Secondary structure of proteins
  - 8E. Metabolism of galactose

(2×5 = 10 marks)

9. **Describe briefly the following:**

- 9A. Reverse cholesterol transport
- 9B. Formation and fate of ammonia

( $1\frac{1}{2} \times 2 = 3$  marks)

10. **Write the enzyme defect and intermediate accumulated or excreted in the following diseases:**

- 10A. Gaucher's disease
- 10B. Hereditary fructose intolerance
- 10C. Refsum's disease
- 10D. Maple syrup urine disease
- 10E. Phenylketonuria

( $1 \times 5 = 5$  marks)

11. **Give biochemical reasons for the following:**

- 11A. Iodoacetate inactivates some enzymes irreversibly
- 11B. High concentration of ATP in the cell slows down glycolysis
- 11C.  $S^{35}$  isotope in methionine appears in bile salts after some time
- 11D. Pepsin is secreted in its zymogen form by chief cells of gastric glands
- 11E. Hemoglobin is a good buffer at physiological pH

( $1 \times 5 = 5$  marks)



**MANIPAL UNIVERSITY**  
**FIRST MBBS DEGREE EXAMINATION – MAY/ JUNE 2011**  
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Tuesday, June 07, 2011

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 40

1. Describe transcription emphasizing on promoters, initiation, elongation, termination and regulation.  
(4 marks)
  
2. Explain chemistry, source, absorption, transport and functions of vitamin D as well as its deficiency disease.  
(3 marks)
  
3. Explain conversion of heme to bilirubin, its further metabolism and excretion.  
(2 marks)
  
4. What is a restriction endonuclease? Explain with suitable examples. Write a note on their use in recombinant DNA technology.  
(2 marks)
  
5. Explain the structure and function of plasma membrane.  
(2 marks)
  
6. **Describe briefly the following:**
  - 6A. Operon model of gene regulation
  - 6B. Diagnostic and therapeutic uses of radio isotopes(2×2 = 4 marks)
  
7. **Write short notes on the following:**
  - 7A. Oncogenes
  - 7B. Tumor markers
  - 7C. Monoclonal antibodies
  - 7D. Lesch-Nyhan syndrome
  - 7E. Functions of riboflavin and pyridoxine
  - 7F. Urea and creatinine estimation in renal function assessment

(1½×6 = 9 marks)

8. Give biochemical reasons for the following:

- 8A. Point mutation in structural gene of a protein need not cause an amino acid substitution
- 8B. Defect in DNA repair system increases incidence of cancer
- 8C. Adenosine deaminase deficiency causes immunodeficiency
- 8D. Puromycin cannot be used as antibiotic in humans
- 8E. Ciprofloxacin antibiotic inhibits proliferation of bacterial cells
- 8F. High quality protein in the diet spares requirement of niacin

(1×6 = 6 marks)

9. Give biochemical / physiological significance of the following reactions:

- 9A.  $\text{ATP} \longrightarrow 3'-5'\text{cyclic AMP}$
- 9B. Vitamin K dependent gamma carboxylation of glutamate
- 9C. *All trans* retinal  $\longrightarrow$  11-*cis* retinal
- 9D. Hypoxanthine  $\longrightarrow$  Inosine Mono Phosphate
- 9E. Proline (in collagen)  $\longrightarrow$  hydroxyproline (in collagen)
- 9F.  $\text{Alanine} + \text{ATP} + \text{tRNA}_{\text{ala}} \longrightarrow \text{Alanyl-tRNA}_{\text{ala}} + \text{AMP} + \text{PPi}$

(1×6 = 6 marks)

10. Write reactions by which following xenobiotics are transformed:

- 10A. Acetylsalicylic acid
- 10B. Benzoic acid
- 10C. Picric acid
- 10D. Atropine

(½×4 = 2 marks)

