

UNIVERSITY OF JAFFNA, SRI LANKA

FIRST EXAMINATION FOR MEDICAL DEGREES- JANUARY 2011

BIOCHEMISTRY PAPER II

DATE: 06.01.2011

Time: 3 Hours

Answer all TEN questions. Answer PART A and PART B in separate answer books.

PART A

- 1.1 1.1.1 Give the importance of different buffer systems in the body. (30 Marks)
- 1.1.2 Discuss the action of important body buffer systems. (30 Marks)
- 1.2 Describe the steps involved in the post translational modification of procollagen molecule. (40 Marks)
- 2.1 Give reactions involved in glycogenolysis as examples for
- 2.1.1 Cascade effect (12.5 Marks)
- 2.1.2 Allosteric activation (12.5 Marks)
- 2.1.3 Covalent modification (12.5 Marks)
- 2.1.4 End product inhibition (12.5 Marks)
- 2.2 Comment on the results of the Oral Glucose Tolerance Test given below:

Time (h)	0	0.5	1	1.5	2
Blood glucose (mg dL <sup>-1</sup> )	75	115	130	90	70
Urine sugar	Nil	Nil	+ve	Nil	Nil

(50 Marks)

3. 3.1 3.1.1 What is meant by the enterohepatic circulation of bile salts? (25 Marks)
- 3.1.2 How the enterohepatic circulation of bile salts is utilized in medical practice? (25 Marks)
- 3.2 Describe briefly how the regular intake of butter in the diet can lead to increased blood cholesterol level. (50 Marks)
4. 4.1 Show how the following conversions are effected in the body. What is the biochemical importance of the product in each case?
- 4.1.1 Glycine to creatine phosphate (20 Marks)
- 4.1.2 Serine to choline (20 Marks)
- 4.1.3 Tryptophan to serotonin (20 Marks)
- 4.2 How would the inclusion of EPA (eicosapentaenoic acid) in the diet of a myocardial infarct patient helps to reduce further heart attacks? (40 Marks)
5. 5.1 5.1.1 ' $\beta$  - Thalassemia is more common than  $\alpha$ -thalassemia'. Explain. (25 Marks)
- 5.1.2 Comment on the serum iron level and the Total Iron Binding Capacity of a patient with  $\beta^+$  thalassemia. (30 Marks)
- 5.1.3 To the patients with  $\beta^+$  thalassemia, repeated blood transfusion and desferoxamine are given. Why? (20 Marks)
- 5.2 Write short notes on acetyl choline esterase. (25 Marks)

- 6.1 A forty year old healthy adult requires 2000 kcals. For the individual to be in optimal health, calculate the amount of energy obtained from the following and explain.
- 6.1.1 Carbohydrates (10 Marks)
  - 6.1.2 Fats (10 Marks)
  - 6.1.3 Proteins (10 Marks)
- 6.2 Explain how the diet consumed by an average Sri Lankan meets the protein requirements mentioned in 6.1.3. (50 Marks)
- 6.3 Tabulate the biochemically important lipases in intestine, preferred substrates and products of each lipases. (20 Marks)

### PART B

- 7.1 7.1.1 Graphically show the effect of glucose concentration on the activities of hexokinase and glucokinase by indicating the  $K_m$  and  $V_{max}$ . (20 Marks)
- 7.1.2 Give the importance of these enzymes under fed and fasting conditions. (20 Marks)
- 7.3 Give the biochemical basis of vitamin A deficiency disorders related to different forms of this vitamin. (60 Marks)
- 8.1 Give the predominant pathway of purine synthesis and its catabolism in brain cells. (60 Marks)
- 8.2 Discuss the role of apoptosis in carcinogenesis. (40 Marks)

9. 9.1 Give the different classes, distribution and functions of immunoglobulins in the body. (50 Marks)
- 9.2 Give the steps involved in gene expression analysis by DNA microarray method. (50 Marks)
10. 10.1 Give the mechanisms controlling the initiation of protein synthesis. (40 Marks)
- 10.2 Write short notes on
- 10.2.1 resistant starch (20 Marks)
  - 10.2.2 whole grain diet (20 Marks)
  - 10.2.3 humanized cow milk (20 Marks)