

UNIVERSITY OF JAFFNA, SRI LANKA.  
FACULTY OF MEDICINE  
FIRST EXAMINATION FOR MEDICAL DEGREES -NOVEMBER 2016

**BIOCHEMISTRY PAPER II**

Date: 2.11.2016

Time: 3 Hours

Answer all TEN questions.

Answer Part A and Part B in separate Answer Books.

Marks allotted to each part are given in brackets.

**PART A**

1. 1.1 The  $K_m$  values of hexokinase and glucokinase for glucose are 0.1mM and 10 mM respectively. What are the advantages of having these two enzymes. (40 Marks)
- 1.2 A 50-year-old overweight male complained of loss of weight and passing more urine than usual. His postprandial glucose level was 250mg/dl.
  - 1.2.1 Describe the oral glucose tolerance test and the results that are expected in this patient. (45 Marks)
  - 1.2.2 <sup>Give</sup> The principle involved in the estimation of glucose by the enzymatic method. (15 Marks)
2. 2.1 Which hormones influence the breakdown of triacylglycerol in adipose tissue? Explain how these hormones act. (50 Marks)
- 2.2 State briefly how the body deals with the products of lipolysis formed in adipose tissue. (50 Marks)
3. 3.1 Explain with reasons which amino acids predominate in the blood under the following conditions
  - 3.3.1 During the first two hours after a meal. (30 Marks)
  - 3.3.2 About 12 hours after the last meal. (30 Marks)
- 3.2 Explain the biochemical basis of calcium deficiency in a patient with postoperative hypoparathyroidism. (40 Marks)
4. 4.1 Give diagrammatically the pathway of iodine metabolism in the thyroid gland indicating the points of action of antithyroid drugs. (60 Marks)
- 4.2 An 8-year-old boy infected with hookworm was anaemic. His serum iron level was decreased and the total iron binding capacity was increased. Explain with reasons. (40 Marks)
5. 5.1 The total serum bilirubin in a patient was 4mg / 100 ml blood and urine urobilinogen was increased. What could be the probable diagnosis? Explain with reasons. (50 Marks)
- 5.2 Heme biosynthesis is repressed by heme. Explain with the help of a diagram how the hydroxylation of certain chemicals / drugs during their detoxification brings about de-repression. (50 Marks)

## PART B

6. 6.1 Show how dietary carbohydrates are digested and absorbed. (50 Marks)  
6.2 Explain "competitive inhibition of enzymes" taking methotrexate as an example with its application. (50 Marks)
7. 7.1 List the functions of proteins and enzymes involved in DNA replication. (40 Marks)  
7.2 Show how protein synthesis in eukaryotic cells is controlled at the initiation phase? (60 Marks)
8. 8.1 Give the functions of glycosaminoglycans with examples. (30 Marks)  
8.2 Explain the biochemical basis of the following:  
8.2.1 Vitamin B<sub>12</sub> deficiency causes neurological disorders. (35 Marks)  
8.2.2 Thiamine deficiency causes lactic acidosis and accumulation of branched chain amino acids in chronic alcoholism. (35 Marks)
9. 9.1 Explain autoimmune disease taking Hashimoto's thyroiditis as an example. (50 Marks)  
9.2 Give the purine salvage pathway and its importance. (50 marks)
10. A 45 year old sedentary male admitted to the hospital was diagnosed to have diabetes type 2. His weight and height were 80 kg and 160 cm respectively. Based on the dietary analysis, it was found that he was consuming 2500kcal per day and was in nitrogen equilibrium.  
10.1 Comment on his calorie and protein consumption per day. (30 Marks)  
10.2 Give your advice with reasons for his weight reduction program. (30 Marks)  
10.3 Give the dietary advice indicating the foods which he can consume with reasons. (40 Marks)