UNIVERSITY OF JAFFNA, SRI LANKA

FIRST EXAMINATION FOR MEDICAL DEGREES (2ND) – AUGUST 2018

BIOCHEMISTRY PART II

Date: 28.08.2018 **Time: 3 Hours**

Answer all 10 questions.
Marks allotted to each part are indicated in brackets.
Answer Part A and Part B in separate Answer Books

PART A

1. **1.1** Show diagrammatically how an increase in glycogenolysis can lead to a decrease in glycogenesis in liver. **(40 Marks)**

   1.2 Explain how red blood cells continue to get its energy source from blood and obtains its energy. **(30 Marks)**

   1.3 Untreated diabetes mellitus patients lose weight. Explain **(30 Marks)**

2. **2.1** Plasma free fatty acid level is increased in starvation. Explain. **(35 Marks)**

   2.2 How does liver differ from other tissues in dealing with free fatty acids in blood formed during starvation? **(40 Marks)**

   2.3 What are the roles of apoprotein of lipoproteins in the metabolism of lipids? **(25 Marks)**

3. **3.1** How the iron absorption in the intestinal mucosal cells is regulated? **(30 Marks)**

   3.2 In a rickets patient α-1,25 – dihydroxy D_3 and serum calcium levels were lower than normal value. Explain **(40 Marks)**

   3.3 Briefly explain why ketones are elevated in phenylketonuria. **(30 Marks)**

4. **4.1** Explain the biochemical basis of physiological jaundice of the new born baby. Would bilirubin be found in the urine of such baby? Explain. **(55 Marks)**

4.2 A 48 year old male admitted to the hospital was diagnosed to have angina pectoris (a coronary artery disease, with a large atherosclerotic plaque obstructing the left anterior descending coronary artery). The obstruction was relieved and the patient received daily aspirin therapy. Following discharge he was advised to take a single aspirin a day. Explain the basis of this aspirin therapy. **(45 Marks)**

5. **5.1** Explain how the vitamin A deficiency causes night blindness. **(35 Marks)**

5.2 Explain the biochemical basis of neurological defects in pernicious anaemia. **(35 Marks)**

5.3 Diagrammatically show how creatine phosphate is synthesised. **(30 Marks)**

PART B

6. A 45 year old man of 160cm height, weighing 80kg had the waist hip ratio of 1.20 (normal 0.85-0.90). In average in a day he consumed 300g carbohydrates, 50g mixed proteins and 80g of lipids.

6.1 Comment on his anthropometric measurements. **(30 Marks)**

6.2 What is his average caloric consumption in a day and comment on protein consumption? **(25 Marks)**

6.3 He has been advised to include more dietary fibres in the meals. Give reasons to increase fibre consumption and examples for dietary fibres. **(45 Marks)**

7. 7.1 Explain how Topoisomerase I inhibitors can function as anticancer drugs. **(30 Marks)**

7.2 7.2.1 What are glycosaminoglycans? **(10 Marks)**

7.2.2 Explain the functions of glycosaminologycans, with two examples **(30 Marks)**

7.3 Explain why ethanol is an antidote for methanol poisoning? **(30 Marks)**

8. 8.1 Diagrammatically show how "sodium dependent glucose transport" takes place in intestinal epithelial cells? **(25 Marks)**

8.2 Explain how alcohol consumption promotes hyperuricemia. **(40 Marks)**

8.3 Give the rate limiting step in purine biosynthesis and show how it is being controlled. **(35 Marks)**

9. 9.1 "Defective Nucleotide Excision Repair in humans results is increased risk for skin cancer" Explain **(40 Marks)**

9.2 Show how initiation phase in protein synthesis is decreased during glucose and amino acid starvation. **(40 Marks)**

9.3 Give the functions of nucleosomes. **(20 Marks)**

10. 10.1 Explain the importance of the following for a specific infection.

10.1.1 Polyclonal antibodies **(50 Marks)**

10.1.2 Memory cells **(20 Marks)**

10.2 Explain how drug detoxification increases haem biosynthesis. **(30 Marks)**