

UNIVERSITY OF JAFFNA

UNIVERSITY OF JAFFNA, SRI LANKA
FIRST EXAMINATION FOR MEDICAL DEGREES – JUNE 2013

BIOCHEMISTRY PAPER II

Date: 11.06.2013

Time: 3 Hours

Answer all ten questions

Marks allotted to each part are indicated in brackets.

Answer Part A and B in separate answer books.

PART A

1. A 25-year-old normal woman was fasting for six days while having two plantains (each weighing 75g) and a cup of milk in the nights. She did not consume coffee or tea during the daytime.
 - 1.1 Explain how her blood glucose was maintained. (50 Marks)
 - 1.2 How much of the following were met by the intake during fasting (consider from a plantain 94k cal is obtained)?
 - 1.2.1 protein requirement (25 Marks)
 - 1.2.2 energy requirement (25 Marks)

2.
 - 2.1 Comment on the ketone body metabolism of the woman mentioned in Question 1. (50 Marks)
 - 2.2 Show the expected plasma electrophoretic lipoprotein pattern of this woman and compare with that of her plasma lipoprotein pattern before she started fasting. (20 Marks)
 - 2.3 Explain how energy production in the mitochondria is self regulated. (30 Marks)

3. 3.1 3.1.1 What is sickle cell anaemia? (20 Marks)
- 3.1.2 A sickle cell anaemic patient cannot tolerate hypoxic condition. Explain. (35 Marks)
- 3.1.3 Explain the serum bilirubin pattern of the patient in 3.1.1. (45 Marks)
4. A 35 year old male was losing weight and was diagnosed to have carcinoma of thyroid gland. Thyroxin level was 350nmol/l (normal 65-156 nmol/l). After total thyroidectomy and removal of invaded lymph nodes, the patient gained weight. The patient maintained a steady weight when treated with thyroid hormone a month after thyroidectomy.
- 4.1. Give the mechanism of action of thyroid hormone and explain the observed changes in the body weight. (55 Marks)
- 4.1. Give the nitrogen balance of this patient before and after thyroidectomy and during thyroid hormone therapy. Explain the changes. (45 Marks)
5. 5.1 Explain how the energy charge of a cell alters the activity of glutamate dehydrogenase. (25 Marks)
- 5.2 Consumption of fish oil reduces thrombosis. Explain. (40 Marks)
- 5.3 Explain how the investigations of the isoenzymes of LDH and CK in the serum of a person who had collapsed during marathon race would help to determine whether the problem was due to myocardial infarction or severe skeletal muscle damage? (35 Marks)

PART B

- 6 6.1 Explain the biochemical basis of pernicious anaemia. (50 Marks)
- 6.2 Explain the biochemical basis of renal rickets. (30 Marks)
- 6.3 Give reasons for increased oxidative stress in heavy smokers. (20 Marks)
- 7 7.1 Explain how ORS can benefit diarrhoea patient? (30 Marks)
- 7.2 Discuss how mixed diet can improve glycemic control (40 Marks)
- 7.3 Discuss the importance of including fat in diet (30 Marks)
- 8 8.1 Explain how alcohol consumption can aggravate gout (40 Marks)
- 8.2 8.2.1 Draw and compare the serum electrophoretic patterns of normal subject and multiple myeloma patient (40 Marks)
- 8.2.2 What is Bence Jones protein (10 Marks)
- 8.2.3 How will you test urine sample for Bence Jones protein (10 Marks)
- 9 9.1 Show how insulin regulates protein synthesis (25 Marks)
- 9.2 “*p53* gene is the most frequently mutated gene in human cancers”
Explain (50 Marks)
- 9.3 Give the functions of albumin (25 Marks)
- 10 10.1 Differentiate between Kwashiorkor and Marasmus (30 Marks)
- 10.2. Discuss the nutritional requirements of a pregnant mother (40 Marks)
- 10.3 Discuss the supplementary action of proteins with example (30 Marks)