

UNIVERSITY OF JAFFNA, SRI LANKA.
FACULTY OF MEDICINE
FIRST EXAMINATION FOR MEDICAL DEGREES –NOVEMBER 2014

BIOCHEMISTRY PAPER II

Date: 13.11.2014

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 Give the pathway indicating the conversion of glucose to lactose in lactating mammary gland and explain how this process is aided by hormone/s.

(35 Marks)
- 1.2 Explain how fructose is metabolized and converted to glucose.

(40 Marks)
- 1.3 Name the proteins that are synthesized in increased amounts in diabetes mellitus and the hormone/s responsible for this increased synthesis.

(25 Marks)

2. 2.1 Show schematically how
 - 2.1.1 Epinephrine and caffeine increase lipolysis.

(35 Marks)
 - 2.1.2 Indicate in your scheme 2.1.1, the steps involved with the
 - 2.1.2.1. activation of an enzyme by covalent modification

(10 Marks)
 - 2.1.2.2. allosteric activation of an enzyme

(10 Marks)

- 2.2. 2.2.1 During starvation, ketone body formation is increased. Explain. (30 Marks)
- 2.2.2 Describe a test to detect the ketone bodies in urine. (15 Marks)
3. 3.1 β - Thalassaemia is more common than α -thalassemia. Explain. (30 Marks)
- 3.2 3.2.1 Explain the biochemical basis of physiological jaundice in new born babies. (30 Marks)
- 3.2.2 Explain the changes in conjugated and unconjugated bilirubin levels in the new born babies and how these babies are treated. (40 Marks)
4. 4.1 4.1.1 Name three good dietary sources of iron in Sri Lankan diet. (15 Marks)
- 4.1.2 How heme and non-heme ions are absorbed? (30 Marks)
- 4.2 A patient with acute asthmatic attack was hospitalized. She was on high intravenous and oral doses of synthetic glucocorticoids. Her glucose tolerance was impaired. The problem was resolved after the drug was discontinued.
- 4.2.1 Give the basis of treating the asthmatic patient with glucocorticoids. (25 Marks)
- 4.2.2 Explain how the administration of glucocorticoids would have affected the glucose tolerance of the patient? (30 Marks)
5. 5.1 Show how the following conversions are effected in the body. What are the biochemical importance of the product in each case?
- 5.1.1 glycine to creatine phosphate (30 Marks)
- 5.1.2 serine to choline (30 Marks)
- 5.2 Why the excretion of amylase in urine increased in pancreatitis? Suggest a test to detect this increased amount of amylase in urine. (30 Marks)

PART B

6. 6.1 Explain the biochemical basis of rickets (50 Marks)
- 6.2 Vitamin B₁₂ deficiency can lead to the following conditions.
Explain
- 6.2.1 Megaloblast formation. (30 Marks)
- 6.2.2 Neurological symptoms. (20 Marks)
7. 7.1 What is opsonization? (25 Marks)
- 7.2 Draw the serum protein electrophoretic pattern of a multiple myeloma patient and compare with that of a normal subject. (40 Marks)
- 7.3 Describe the digestion and absorption of rice in the gastrointestinal tract in adult. (35 Marks)
8. 8.1 Show how "Flow of genetic information" takes place? (30 Marks)
- 8.2 Give the functions of plasma proteins with examples. (20 Marks)
- 8.3 Explain the biochemical basis of the use of 5-fluorouracil and methotrexate in chemotherapy of cancer. (50 Marks)
9. 9.1 Discuss the health benefits of low glycemic index diet. (40 Marks)
- 9.2 Condensed milk or skimmed milk is not suitable to feed infants. Explain. (30 Marks)
- 9.3 Explain "supplementary action of protein" with example. (30 Marks)

10. 10.1 10.1.1 A forty year old healthy Sri Lankan adult requires 2000 kcals. How much of the 2000 kcal must be obtained from dietary carbohydrates, fats and proteins for the individual to be in optimal health. Explain.

(30 Marks)

10.1.2 Explain and justify how the diet consumed by adult meets the protein needs you have mentioned in 10.1.1.

(30 Marks)

10.2 10.2.1 Explain obligatory nitrogen loss.

(20 Marks)

10.2.2 Calculate the obligatory nitrogen loss per day of a healthy adult woman weighing 50kg?

(20 Marks)