

FACULTY OF MEDICINE, UNIVERSITY OF JAFFNA, SRI LANKA
SECOND EXAMINATION FOR MEDICAL DEGREES –JUNE 2009

BIOCHEMISTRY PAPER II

Date: 09.06.2009

Time: 3 Hours

Answer all six questions. Marks allotted to each part are given in brackets.

1. 1.1 The K_m values of glucokinase and hexokinase for glucose are 10 and 0.005mM respectively. What are the significances of these enzymes in the hepatic and extrahepatic cells? (20 Marks)
- 1.2 What are the gluconeogenic substrates? Give the types of substrate and indicate diagrammatically how they enter the gluconeogenic pathway and TCA cycle. (60 Marks)
- 1.3 Give the composition of Oral Rehydration Solution (ORS) and what is the biochemical basis of its use? (20 Marks)

2. 2.1 Name the plasma lipoproteins which are rich in cholesterol and triacylglycerols. (10 Marks)
- 2.2 What are the functions of the apoproteins? (20Marks)
- 2.3 List the hormones which influence the breakdown of triacylglycerol in adipose tissue? Explain how they act to influence the breakdown of triacylglycerol. (40Marks)
- 2.4 State briefly how the body deals with the products of lipolysis formed in adipose tissue. (30Marks)

3. 3.1 Explain the immediate biochemical changes which would occur to meet the oxygen need of the tissues when one changes residence from sea level to high altitude. (20 Marks)
- 3.2 3.2.1 Give the sites and basis of action of carbon monoxide. (20 Marks)
- 3.2.2 If an individual is exposed to carbon monoxide, on what biochemical basis can he be treated? (15 Marks)
- 3.3 Explain autoimmune disease taking myasthenia gravis as an example and give the biochemical basis of the use of neostigmine. (45 Marks)
4. 4.1 Show how the following conversions are effected in the body and explain the biochemical importance of the products?
- 4.1.1 glycine to creatine phosphate (15 Marks)
- 4.1.2 tryptophan to serotonin (15 Marks)
- 4.2 Explain the influence of dietary fiber on Glycemic Index and Glycemic load of a diet. (40 Marks)
- 4.3 Write short notes on
- 4.3.1 fluorosis (15 Marks)
- 4.3.2 hypothyroidism (15 Marks)
5. 5.1 5.1.1 Outline how "Restriction Fragment Length Polymorphism" would be useful to analyze fetal DNA for sickle cell gene. (40 Marks)
- 5.1.2 Explain how the above results would be useful for "Genetic Counseling" (30 Marks)
- 5.2 Show how protein synthesis is controlled at the initiation phase. (30 Marks)

6. 6.1 A forty year old healthy adult requires 2000kcal. 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)**
- 6.2 Explain and justify how the diet consumed by an average Sri Lankan vegetarian meets the protein requirements you have mentioned in 6.1 **(20 Marks)**
- 6.3. An undernourished alcoholic aged 55 year had of dryness of the eyes and temporary blindness when moving from areas of bright to dim light. Give biochemical explanations for
- 6.3.1 the dryness of the eye **(20 Marks)**
- 6.3.2 temporary blindness of the eye **(30 Marks)**