

UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF MEDICINE
FIRST EXAMINATION FOR MEDICAL DEGREES –MARCH 2013

BIOCHEMISTRY PAPER II

Date: 19.03.2013

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 value of hexokinase and glucokinase for glucose are 0.5mM and 20mM respectively. What is the significance of these K_m values of these enzymes in an adult? **(40 Marks)**
- 1.2 Explain how glycogenolysis and glycogenesis are reciprocally controlled. **(60 Marks)**

2. 2.1 List the functions of the apoproteins of lipoproteins. **(40 Marks)**
- 2.2 Explain how the cellular cholesterol level is controlled. **(60 Marks)**

3. 3.1 Outline the steps leading to the formation of heme. **(50 Marks)**
- 3.2 In lead poisoning the urinary excretion of aminolevulinic acid and coproporphyrin III are elevated. Explain. **(50 Marks)**

4. 4.1 Explain how the plasma calcium level is regulated. **(50 Marks)**
- 4.2 Rickets was observed in a child with chronic steatorrhoea. Explain. **(30 Marks)**
- 4.3 Explain how iron is stored in the body. **(20 Marks)**

5. 5.1 Describe the pathways by which the major nitrogen excretion products are synthesized in man. **(50 Marks)**
- 5.2 Explain how ATP is synthesized in a cell under anaerobic condition. **(25 Marks)**
- 5.3 Give the basis of treating asthmatic patients with glucocorticoids. **(25 Marks)**

PART B

6. 6.1 Explain the following briefly
- 6.1.1 megaloblastic anemia in pregnancy **(20 Marks)**
 - 6.1.2 metabolic syndrome **(20 Marks)**
 - 6.1.3 malnutrition and infection **(20 Marks)**
- 6.2 How does allopurinol reduces serum uric acid level. **(40 Marks)**
7. 7.1 Explain how HIV infection affects the function of immune system. **(70 Marks)**
- 7.2 Give the functions of plasma proteins with examples. **(30 Marks)**
8. 8.1 Write short notes on "Regulation of protein synthesis". **(30 Marks)**
- 8.2 Explain the biochemical basis of treating myasthenia gravis using neostigmine. **(70 Marks)**
9. 9.1 Show how antioxidant vitamins reduce oxidative stress. **(50 Marks)**
- 9.2 Show why vitamin K is important for blood clotting. **(50 Marks)**

10. Miss. Leela, a 20 years-old University student with 40kg weight and 150 cm height met her General physician with the complaints of lethargy, frequent faint, drowsiness and lack of concentration in her studies. Her haemoglobin level was 8.2 g/dL, serum ferritin level was 8ng/mL (normal 12-150 ng/mL) and urinary iodine concentration was 166µg/L (Normal 100-199 µg/L).

Her dietary pattern per a day

Breakfast	-A cup of milk -100 g White bread -15 g Dhal
Lunch	-100g Parboiled rice -20 g Potato -30 g Fish
Dinner	-100 g String hopper -40 g Meat

- 10.1 Comment on her Body Mass Index. **(15 Marks)**
- 10.2 What could be the micronutrient deficiency and give reasons. **(15 Marks)**
- 10.3 Comment on her daily calorie intake and how would you provide the diet menu to balance the recommended calorie intake. **(50 Marks)**
- 10.4 What changes in the nitrogen balance would you expect if she increase the meat/fish intake by 150 g. **(20 marks)**