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UNIVERSITY OF JAFFNA, SRI LANKA.

FACULTY OF MEDICINE

FIRST EXAMINATION FOR MEDICAL DEGREES –AUGUST 2014

BIOCHEMISTRY PAPER II

Date: 12.08.2014 **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. A 50 year old overweight male complained of loss of weight and passing more urine than usual. His urine gave a reddish yellow color for Benedict's test.

   1.1 Describe the oral glucose tolerance test and the principle involved in the estimation of glucose by the enzymatic method. (**30 Marks**)

   1.2 Graphically show how the oral glucose tolerance curve of this patient will differ from that of a normal curve. Explain (**25 Marks**)

   1.3 Indicate below the time axis the results of the Benedict's test with the urine obtained at various times of this test. Explain. (**15 Marks**)

   1.4 Explain the loss of weight and passing more urine than normal. (**30 Marks**)

2. **2.1** Plasma free fatty acids are 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? (**35 Marks**)

   2.3 What are the roles of apoproteins in the metabolism of lipoproteins? (**30 Marks**)

3. **3.1** Discuss the factors which affect the oxygen dissociation curve.

(30 Marks)

3.2 **3.2.1** Explain qualitative haemoglobinopathy taking sickle cell anemia as an example. **(30 Marks)**

3.2.2 Explain the changes in conjugated and unconjugated bilirubin levels in this patient and how these parameters would be measured.

(40 Marks)

4. **4.1** **4.1.1** How would you differentiate hyperthyroidism and hypothyroidism in patients with goiter? Give the biochemical basis for your explanation. **(40 Marks)**

4.1.2 Explain the basis of occurrence of thyrotoxicosis and its complication. **(30 Marks)**

4.2 Give the biochemical basis of treating asthmatic patients with steroids.

(30 Marks)

5. **5.1** A patient with cirrhosis was admitted to a hospital. With relevant medical investigations he was intravenously administered with α- ketoglutarate and pyruvate.

5.1.1 Explain with reasons for the administration of α- ketoglutarate and pyruvate. (**30 Marks**)

5.1.2 For the advanced cases glucose administration is preferred than α-ketoglutarate and pyruvate, give reasons with explanation.

(**35 Marks**)

5.2 A 60 year male had severe chest pain and was admitted to the hospital immediately after the pain. His ECG was abnormal and he was diagnosed to have had myocardial infraction.

5.2.1 Diagrammatically show the serum enzymes pattern of this patient.

(**20 Marks**)

5.2.2 Which fraction of the creatine kinase is elevated in this patient?

(**15 Marks**)

PART B

6. **6.1** Explain how could β-carotene interact with cigarette smoke in human bronchial epithelial cells. **(20 Marks)**

   6.2 Give the biochemical basis of secondary hyperparathyroidism in chronic kidney disease. **(40 Marks)**

   6.2 Explain the biochemical basis of 'Neurological defects in pernicious anaemia'. **(40 Marks)**

7. **7.1** Explain what is antibody diversity? **(25 Marks)**

   7.2 Give the distribution and functions of immunoglobulin isotypes. **(50 Marks)**

   7.3 Describe the digestion and absorption of coconut fat in the gastrointestinal tract in adult. **(25 Marks)**

8. **8.1** Show how HMG-CoA reductase gene expression is controlled. **(50 Marks)**

   8.2 Explain competitive inhibition of acetyl choline esterase enzyme and its clinical application. **(50 Marks)**

9. **9.1** A mother noticed that her son of age 4 years developed the compulsive urge to bite his fingers and lips. Urinary uric acid output was twofold of normal value. Further laboratory investigations indicated that the child has megaloblastic anemia.

   9.1.1 Give reasons and explanations for the above observations. **(30 Marks)**

   9.1.2 If allopurinol is accidentally taken the problem will be aggravated. Why? **(30 Marks)**

   9.1.3 What dietary advice would you give to this patient give reasons.

(40 Marks)

10.10.1 A 55 kg man in nitrogen equilibrium ~~induces~~ included 350g (raw weight) of polished rice in his daily diet. Calculate the approximate percentage of his

10.1.1 Calories. **(15 Marks)**

10.1.2 Protein requirement met by the rice component of his diet. **(15 Marks)**

10.1.3 What changes in nitrogen balance of the above individual would you expect if he increases his protein intake by 40g of fish protein keeping his diet isocaloric? **(15 Marks)**

10.2 Explain how the amino groups of the amino acids in the blood after 12h of last meal are converted to urea. **(55 Marks)**