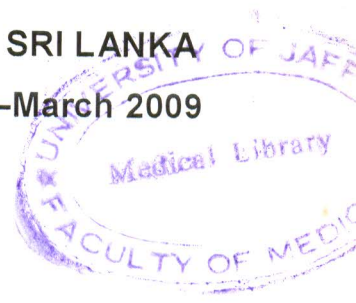


FACULTY OF MEDICINE, UNIVERSITY OF JAFFNA, SRI LANKA
SECOND EXAMINATION FOR MEDICAL DEGREES – March 2009



BIOCHEMISTRY PAPER II

Date: 12.03.2009

Time: 3 Hour

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

1. A 60 year old male teacher who was living alone after the death of his wife was found in confused state. When he was admitted to the hospital by his neighbours, the following laboratory findings were obtained.

	Patient	Normal range
Haemoglobin level (gdL^{-1})	8.7	12.0 - 15.5
Serum iron ($\text{mg } \mu\text{L}^{-1}$)	38.0	42.0 - 135.0
Serum folic acid (ng mL^{-1})	0.9	3.0 - 29.0
Vitamin B ₁₂ (pg mL^{-1})	190.0	180.0 - 914.0
Serum albumin (g dL^{-1})	3.2	3.5 - 5.0
Blood glucose (mg dL^{-1})	70	70.0 - 100.0

He weighed 50kg and his height was 180 cm. On discussion, it was found that the patient has lost 15kg of his weight in 8 months.

- 1.1 Based on the above findings, what probable defect/s can you expect in the above patient? (15 Marks)
- 1.2 Give reasons for the reduction in his body weight and explain his nitrogen balance at the time of admission. (40 Marks)
- 1.3 Comment on and explain the glucose level and alterations in amino acids in the blood of this patient at the time of admission. (45 Marks)

- 2 2.1 Explain the serum ketone body and free fatty acid levels of the patient (given in Question 1) on the day of admission by giving reasons. (45 marks)
- 2.2 Name two tests and outline the procedures and reagents used for the analysis of 'ketone bodies' in urine. (30 Marks)
- 2.3 What results would you observe with the urine sample of the patient (given in Question 1) for the test given in Question 2.2? Give reasons. (25 Marks)
- 3 3.1 Exclusive breast feeding is recommended for an infant up to 4months for better growth, brain development and immunity. Explain. (50 Marks)
- 3.2 A 7month old infant was presented with lethargy, failure to thrive, and non responsive even to painful stimuli. He was exclusively breast fed by a strict vegetarian (vegan) mother.
- 3.2.1 What could be the probable cause for the conditions? Explain. (30 Marks)
- 3.2.2 Give the abnormal constituents that could appear in the urine of the infant. Explain. (20 Marks)



4. 4.1 Laboratory findings of a 30 year old male were as follows:

	Patient	Normal range
Alanine transaminase (Units L ⁻¹)	294.0	5.0 -30.0
Aspartate transaminase (Units L ⁻¹)	268.0	10.0- 30.0
Serum alkline Phosphatase (UnitsL ⁻¹)	284.0	40.0-125.0
Serum Bilirubin (mg mL ⁻¹)	9.6	0.2- 1.0

4.1.1 What could be the probable **problem** in this patient?

(10 Marks)

4.1.2 Which fraction/s of the bilirubin would have been elevated in this patient. Explain with reasons.

(25 Marks)

4.1.3 Give reasons for the elevation of the above said enzymes.

(15 Marks)

4.2

A 25 year old man who had heat intolerance with sweating, palpitation for the past four months. He has lost weight in spite of good appetite. He has been sleeping poorly and on examination it was observed that his heart rate was increased and hand tremor was observed as he extended his arm in front of his chest. His thyroid gland was enlarged three times of the normal size.

4.1.1 What could be the probable **defect** in this patient?

(10 marks)

4.1.2 Analysis of which biochemical/s would be useful to confirm the condition

(15 Marks)

4.1.3 Give the biochemical basis **for** the increased appetite and loss of weight.

(25 Marks)



5. 5.1 5.1.1 Give the functions of plasma proteins. (20 Marks)
- 5.1.2 What are the causes for decreased albumin concentration in blood, except that mentioned in question 1. (20 Marks)
- 5.1.3 Give an example of a condition with low serum albumin and compare the serum protein electrophoretic pattern with that of a normal person. (20 Marks)
- 5.2 5.2.1. Give the classification and characteristics of stem cells. (20 Marks)
- 5.2.2. Write short notes on the applications of stem cells in Medicine. (20 Marks)

6. 6.1 A labourer aged 45 year had collapsed while working and admitted to hospital. The patient said that he had pain in his toes for several months and had been drinking too much of alcohol. Analysis of the blood sample gave the following results:

Component	Patient	Normal range
Alcohol (mmol/l)	8.2	-
Glucose (mmol L ⁻¹)	2.8	3.3-8.4
Lactate (mmol L ⁻¹)	2.8	0.7-2.0
Urate (mmol L ⁻¹)	0.7	0.2-0.5

On admission, he was treated with allopurinol. Three days latter his plasma urate fell to normal level.

- 6.1.1 Explain the occurrence of high plasma urate level in this patient. (30 Marks)
- 6.1.2 Explain how allopurinol would have lowered the plasma urate level. (20 Marks)
- 6.2. Give the importance of polyclonal antibodies and memory cells produced by the body against a particular infection. (50 Marks)

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