



UNIVERSITY OF JAFFNA, SRI LANKA
FACULTY OF MEDICINE
FIRST EXAMINATION FOR MEDICAL DEGREES (2nd) - JANUARY 2020

BIOCHEMISTRY PAPER II

21. 01.2020

Time: 3 Hours

Answer all 10 questions.

Marks allotted to each part are indicated in brackets.

Answer Each Question on Separate Answer Book.

1. A 14 year-old- boy was lagging behind in his class and was lethargic. His mother complained that he wakes up in the nights at least three times and passes urine. Further she informed his passion towards food during recent times, especially for sweets increased many fold. His fasting blood sample was analysed and the following results were obtained.

Plasma Biochemical	Results	Normal Range
Glucose (mg/dL)	200	Expected to know
Total Cholesterol (mg/dL)	200	200-239
Triacylglycerol (mg/dL)	200	Less than150
Urea (mg/dL)	30	7-20

1.1 Give reasons for the changes in the above said four biochemical levels. **(70 Marks)**

1.2 Give the causes for a 14 year old boy to get diabetes. **(30 Marks)**

2. 2.1 A 68 year – old labourer presented complaining of loss of weight, tiredness and loss of appetite. He had lost 19kg during the previous 3 months but he had been eating normally up until 3 week previously. He had no experienced abdominal pain, but on questioning admitted drinking alcohol moderately for most of his life. He also stated that he had been passing dark coloured urine for some time and that his stools were quite pale. The biochemical investigations gave the following results.

Plasma Analysis	Results	Reference Range
Albumin (g/L)	36	36-47
ALP activity (U/L)	632	40-125
ALT activity (U/L)	35	10-40
Total Bilirubin ($\mu\text{mol/L}$)	90	2-17
GGT activity (U/L)	200	10-55

Urine analysis showed the presence of bilirubin and urobilinogen was undetectable. Explain the above observations of

- 2.1.1 elevated Total bilirubin level. **(30 Marks)**
- 2.1.2 elevated ALP and GGT activities. **(20 Marks)**
- 2.1.3 those made in the urine. **(20 Marks)**
- 2.2 What tests may have to be carried out with serum & urine to confirm the said type of hyperbilirubinemia and explain the observed results of each test? **(30 Marks)**

3. 3.1 Explain how calcitriol and parathyroid hormone maintain calcium homeostasis. **(30 Marks)**
- 3.2 Write a note on the biochemical function of selenium in the second line of anti-oxidant. **(30 Marks)**
- 3.3 3.3.1 Discuss the main causes of iron deficiency anaemia in school going children below 10 years. **(20 Marks)**
- 3.3.2 Give the biochemical tests to confirm the iron deficiency anaemia in the school going children below 10 years. **(20 Marks)**

4. 4.1 Explain the down regulation of the cholesterol receptor. (30 Marks)
- 4.3 Explain how the elevation in LDL level leads to atherosclerosis.(40 Marks)
- 4.3 Explain the role of homocysteine in precipitating the formation of atherosclerotic plaque. (30 Marks)
5. Explain the biochemical basis of
- 5.1 phenylketonuria. (45 Marks)
- 5.2 Maple syrup urine disease. (25 Marks)
- 5.3 the use of the isoenzymes of creatine kinase for differential diagnosis. (30 Marks)
6. 6.1 A 45 year old woman underwent partial gastrectomy and developed a mixed type of anaemia and later developed neuropsychiatric symptoms. Explain the biochemical basis of the above conditions. (60 Marks)
- 6.2 Chronic alcohol consumption is a risk factor for alcohol induced brain damage. Explain. (40 Marks)
7. 7.1 The “Nucleotide Excision Repair” is an important mechanism to prevent skin cancer. Explain (35 Marks)
- 7.2 Explain the biochemical basis of the therapeutic application of statin for hypercholesterolemia (35 Marks)
- 7.3 Give the molecular function of a tumour suppressor gene with example. (30 Marks)



8. Serum protein electrophoresis of a patient with severe bone pain and recurrent infections showed a sharp narrow peak in the γ -globin zone. Urinalysis revealed the presence of moderate proteinuria.
- 8.1 Draw the serum electrophoretic pattern of the above patient and compare it with normal pattern. Explain the biochemical basis. (50 Marks)
- 8.2 Give reasons for bone pain, recurrent infection and proteinuria. (40 Marks)
- 8.3 Give a test that you would perform with urine to identify the protein. (10 Marks)
9. 9.1 HGPRTase deficiency can cause hyperurcemia. Explain (40 Marks)
- 9.2 Alcohol consumption is a risk factor for gout. Explain (40 Marks)
- 9.3 How does allopurinol reduce serum uric acid level? (20 Marks)
10. 10.1 Give the problems that may be encountered by feeding cow's milk to an infant (40 Marks)
- 10.2 Explain the additional energy requirement of a pregnant mother of 55kg weight and 155cm height. (30 Marks)
- 10.3 Give dietary advice to the above pregnant mother (40 Marks)