



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA
Second Examination for Medical Degrees –October 2013
Biochemistry Paper II

Tuesday 8th October 2013

2.00 p.m. – 5.00 p.m.

Answer All Six Questions.

(Three hours)

Answer each question in a separate book.

Marks allocated to each part of a question are shown within parenthesis.

- 1.0 Following biochemical investigations were performed on a patient with suspected liver pathology. State the biochemical rationale behind the tests mentioned below.
- 1.1 Serum bilirubin concentration *(15 marks)*
 - 1.2 Serum albumin concentration *(10 marks)*
 - 1.3 Prothrombin time *(15 marks)*
 - 1.4 Serum concentrations of ALT and AST *(20 marks)*
 - 1.5 Serum concentration of alkaline phosphatase *(20 marks)*
 - 1.6 Serum concentration of gamma-glutamyl transpeptidase *(20 marks)*
- 2.0 Explain the biochemical basis of the following
- 2.1 Allopurinol is used along with chemotherapeutic agents in the treatment of cancer. *(25 marks)*
 - 2.2 HbA1c concentration is useful in the diagnosis as well as monitoring a patient with diabetes mellitus. *(25 marks)*
 - 2.3 Ketoacidosis is a complication of uncontrolled type 1 diabetes mellitus. *(25 marks)*
 - 2.4 Streptokinase is used as a thrombolytic agent. *(25 marks)*
- 3.0 3.1 Explain the biochemical basis for the use of following in advanced liver disease.
- 3.1.1 Metronidazole *(25 marks)*
 - 3.1.2 Lactulose *(25 marks)*
- 3.2 Explain the role of
- 3.2.1 creatine phosphate in the heart muscle cells. *(25 marks)*
 - 3.2.2 NAD⁺ in the action of diphtheria toxin. *(25 marks)*

4.0 4.1 Explain the functions of the following.

4.1.1 Membrane phospholipids in the immediate hypersensitivity reaction. (25 marks)

4.1.2 Plasma haptoglobin (25 marks)

4.2 Explain the biochemical basis for the occurrence of lactic acidosis in

4.2.1 tissue hypoxia. (25 marks)

4.2.2 the deficiency of glucose 6-phosphatase. (25 marks)

5.0 Explain the following.

5.1 Parathyroid hormone and calcitonin have antagonistic actions on plasma calcium levels. (25 marks)

5.2 Fluoridation limit of community water supply should not exceed 1 ppm. (25 marks)

5.3 Homocysteinaemia occurs in folate deficiency. (25 marks)

5.4 Nitrogen balance is altered following a surgical operation and during convalescence. (25 marks)

6.0 Explain the following.

6.1 A point mutation in HbA leads to sickling of red blood cells. (25 marks)

6.2 Reducing agents are administered in acquired methaemoglobinaemia. (25 marks)

6.3 Photosensitivity is a feature in protoporphyria. (25 marks)

6.4 PCR technique is used in the prenatal diagnosis of diseases. (25 marks)
