



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA
Second Examination for Medical Degrees – March 2011
Biochemistry Paper II

Wednesday 16th March 2011.

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.

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1. 1.1 Explain the following.
- 1.1.1 The role of LDL in cholesterol metabolism. (25 marks)
- 1.1.2 The ratio of LDL to HDL concentration is used to evaluate the susceptibility to cardiovascular disease. (25 marks)
- 1.1.3 A patient suspected of having a defective lecithine:cholesterol acyltransferase (LCAT) enzyme showed low HDL, high free cholesterol and low cholesteryl ester concentrations in the plasma. (25 marks)
- 1.2 Name the vitamin that is derived from cholesterol and briefly explain the implications of its deficiency. (25 marks)
2. Explain the biochemical basis of the following.
- 2.1 Adenosine deaminase deficiency is a cause for severe combined immunodeficiency disorder. (25 marks)
- 2.2 Glucose 6-phosphate dehydrogenase deficiency may cause episodes of jaundice. (25 marks)
- 2.3 Phenylalanine hydroxylase deficiency gives rise to mental retardation. (25 marks)
- 2.4 Fructose-1, 6-bisphosphatase deficiency is a cause for hypoglycaemia. (25 marks)
3. 3.1 Explain the importance of the following on hormone action.
- 3.1.1 Hormone response element (25 marks)
- 3.1.2 cGMP (25 marks)
- 3.2 Describe the biochemical basis of the following.
- 3.2.1 Analysis of restriction fragment length polymorphism (RFLP) in the diagnosis of a hereditary disease. (25 marks)
- 3.2.2 Analysis of polymerase chain reaction (PCR) in the diagnosis of infectious diseases. (25 marks)

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4. Explain the biochemical basis of the following.
- 4.1 Estimation of serum α -fetoprotein concentration in a male patient with suspected liver disease. *(30 marks)*
 - 4.2 Estimation of serum troponin concentration in a patient admitted to hospital with a chest pain. *(30 marks)*
 - 4.3 Analysis of serum and urine electrophoresis patterns in a patient suspected of having multiple myeloma. *(40 marks)*
5. 5.1 Explain the biochemical basis of the following.
- 5.1.1 Skin lesions in certain porphyrias. *(25 marks)*
 - 5.1.2 Hyperammonaemia in a chronic alcoholic. *(25 marks)*
- 5.2 Explain the role of glutamate, glutamine and alanine in nitrogen metabolism. *(50 marks)*
6. Explain the following.
- 6.1 Hypoalbuminaemia, fatty liver and impaired immunity are features of severe protein energy malnutrition. *(30 marks)*
 - 6.2 In Sri Lanka anaemia is common in women of reproductive age. *(30 marks)*
 - 6.3 Vitamin B₁₂ deficiency leads to elevated blood homocysteine concentration. *(20 marks)*
 - 6.4 Increased intake of food and beverages rich in fructose is a cause of obesity. *(20 marks)*
