



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA,
Second Examination for Medical Degrees – December 2004
BIOCHEMISTRY PAPER II

Wednesday, 08th December, 2004

2.00 p.m.–5.00 p.m.

Answer All Six Questions.

(3 hours)

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

1. 1.1 A young insulin dependent diabetic patient attended the clinic for regular follow up. The following investigations were done.

Analyte	Result
Blood glucose (2hr after breakfast)	18 mmol/ L
Urine glucose (early morning)	2 %
Hb A _{1c}	6.5%

1.1.1 Comment on the above results. (30 marks)

1.1.2 State the other tests of value in monitoring patients for diabetic complications. (20 marks)

- 1.2 Compare and contrast the functions of pancreatic lipase, lipoprotein lipase and hormone sensitive lipase. (50 marks)

2. Explain the biochemical basis of one test each to investigate the following.

2.1 Suspected myocardial infarction four days after the onset of chest pain. (25 marks)

2.2 Chronic liver damage. (25 marks)

2.3 Multiple myeloma. (25 marks)

2.4 Galactosaemia. (25 marks)

3. Give biochemical explanations for the following.

3.1 Formation of cataract in uncontrolled diabetes mellitus. (25 marks)

3.2 Inhibition of protein biosynthesis by diphtheria toxin. (25 marks)

3.3 Production of a polypeptide both garbled and prematurely terminated by deletion of a nucleotide from a gene. (25 marks)

3.4 Maintenance of alveolar stability by surfactants. (25 marks).

Contd...2

4. Explain the biochemical basis for the following manifestations in glucose 6-phosphatase deficiency.
- 4.1 Hypoglycaemia. *(25 marks)*
 - 4.2 Hepatomegaly. *(25 marks)*
 - 4.3 Hyperuricaemia. *(25 marks)*
 - 4.4 Hyperlipidaemia. *(25 marks)*
5. 5.1 Give one example in each case of a post translational modification of a protein brought about by
- 5.1.1 vitamin A
 - 5.1.2 vitamin C.
 - 5.1.3 vitamin K *(30 marks)*
- 5.2 Explain the biochemical functions of the modified protein mentioned in 5.1.1, 5.1.2 and 5.1.3. *(30 marks)*
- 5.3 The deficiencies of vitamins A, C and K lead to synthesis of defective proteins. Describe the clinical features of the resulting disease conditions. *(20 marks)*
- 5.4 Describe the dietary measures that could be used to prevent the deficiency of vitamins A, C and K. *(20 marks)*
6. Explain the following.
- 6.1 Fatty liver in protein energy malnutrition. *(25 marks)*
 - 6.2 Regulation of metabolic pathways by feed back inhibition. *(25 marks)*
 - 6.3 Use of human restriction fragment length polymorphism (HRFLP) in prenatal diagnosis. *(25 marks)*
 - 6.4 Photosensitivity in porphyrias. *(25 marks)*
