



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA

Second Examination for Medical Degrees-November 2020

Biochemistry-Paper II

Answer All Five Questions.

Answer each question in a separate book.

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

Handover each book separately.

30th November 2020

2.00 p.m- 5.00 p.m

(Three hours)

1.
 - 1.1.1 Explain the regulation of vitamin D metabolism and the role of vitamin D in calcium homeostasis in the body. (35 marks)
 - 1.1.2 Describe the process of iron absorption at the intestine and the regulation of body iron level. (30 marks)
- 1.2 Explain the biochemical basis of the following.
Development of hypothyroidism after administering radioactive iodine to patients with Graves' disease. (35 marks)
2. Explain the biochemical basis of the following.
 - 2.1 Ketoacidosis is a result of prolonged ketosis. (25 marks)
 - 2.2 Occurrence of hypertriglyceridaemia in type 1 diabetes mellitus. (25 marks)
 - 2.3 Occurrence of mental retardation in classical phenylketonuria. (25 marks)
 - 2.4 Maintenance of normal or near-normal plasma homocysteine concentrations is the treatment target in homocysteinaemia. (25 marks)
3. Explain the biochemical basis of the following.
 - 3.1 Use of cardiac troponin in the diagnosis and in the assessment of severity of an acute myocardial infarction. (25 marks)
 - 3.2 Estimation of serum alkaline phosphatase in the diagnosis of liver and bone diseases. (25 marks)
 - 3.3 Exaggerated physiological jaundice in a new-born is a cause of neurological damage. (25 marks)
 - 3.4 Use of azidothymidine (AZT) as an antiviral agent. (25 marks)

Contd.

4. 4.1 Explain the biochemical basis of the following.
- 4.1.1 Administration of a galactose free milk formula to a neonate diagnosed with galactose 1-phosphate uridyl transferase deficiency. (25 marks)
- 4.1.2 Administration of sodium benzoate and sodium phenylacetate in hyperammonaemia. (25 marks)
- 4.2 Explain the following.
- 4.2.1 The cellular mechanisms involved in the skeletal muscle cells in regulating the blood glucose concentration after a meal. (25 marks)
- 4.2.2 The role of hormones in the regulation of gene expression at target cells. (25 marks)
5. 5.1 A healthy 30 year-old female of 60 kg body weight and BMR of 24 kcal/kg/day spends 8 hours in sleeping (activity factor= 1), 8 hours in moderate activity (activity factor =2), 4 hours in discretionary activity (activity factor= 3) and the rest of the period utilizing energy at a rate of 1.5 BMR.
- Safe level of protein intake of an individual = 0.75 g/kg/day
 Digestibility of proteins in a mixed diet = 80%
- 5.1.1 Calculate
- 5.1.1.1 her daily energy expenditure. (15 marks)
- 5.1.1.2 the amount of carbohydrate, protein, and fat that should be included in the diet. (20 marks)
- 5.1.1.3 total energy and protein requirement if she becomes pregnant. (15 marks)
- 5.2 Explain the following.
- 5.2.1 The main considerations in planning a diet of a patient with chronic renal failure. (25 marks)
- 5.2.2 Application of restriction fragment length polymorphism (RFLP) analysis in paternity testing. (25 marks)

Exam papers
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