



FACULTY OF MEDICINE, UNIVERSITY OF RUHUNA
B.Sc. Medical Laboratory Science Degree Program
Year End Examination - Year 1 (8th Batch) - January 2017



Cell Biology and Biochemistry

MLS - 1102

31st January 2017

Two hours

Answer any four questions.

9.30 a.m - 11.30 a.m

53

Marks allocated to each question are given within parenthesis.

1. Explain the following.
 - 1.1 Ingestion of uncouplers causes a rise in body temperature. (25marks)
 - 1.2 Pyruvate kinase deficiency causes anemia. (25 marks)
 - 1.3 N-acetylglutamate synthase deficiency leads to severe hyperammonemia. (25marks)
 - 1.4 The role of G-proteins in the action of cholera toxin. (25marks)

2.
 - 2.1 Name two laboratory techniques that are used to separate lipoproteins. (10 marks)
 - 2.2 List the lipoproteins found in serum after an overnight fast. (10 marks)
 - 2.3 What are the factors to be taken into account when collecting blood for plasma lipid investigation? (30 marks)
 - 2.4 Explain the following.
 - 2.4.1 Mechanism of action of thyroid hormones at the target cells. (25 marks)
 - 2.4.2 The relationship between parathyroid hormone and calcium homeostasis. (25 marks)

3.
 - 3.1 State the normal fasting blood glucose concentration. (05 marks)
 - 3.2 List three processes which cause the entry of glucose into blood. (15 marks)
 - 3.3 Explain the regulation of blood glucose concentration after a meal. (40 marks)
 - 3.4 Explain the biochemical basis for the occurrence of hypoglycaemia in ethanol intoxication. (40 marks)

53

4. 4.1 List four characteristics of the genetic code. (10 marks)

4.2 Briefly discuss the significance of the following in protein biosynthesis.

4.2.1 t-RNA (10 marks)

4.2.2 Aminoacyl t-RNA synthetase (10 marks)

4.3 Briefly explain the post translational modifications of the polypeptide chain and its significance. (20 marks)

4.4 Write short notes on the following.

4.4.1 Gluconeogenesis (25 marks)

4.4.2 Isolation of sub-cellular organelles of the cell. (25 marks)

5. 5.1 Describe the anti-oxidant property of the following vitamins.

5.1.1 Vitamin C (10 marks)

5.1.2 Vitamin A (10 marks)

5.1.3 Vitamin E (10 marks)

5.2 Briefly explain the biochemical basis of the following conditions that occur due to folic acid deficiency.

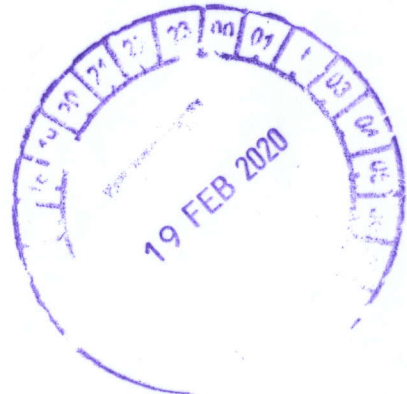
5.2.1 Anemia (10 marks)

5.2.2 Neural tube defects (10 marks)

5.3 Briefly explain the biochemical basis of the action of following drugs.

52

- 5.3.1 Allopurinol (10 marks)
- 5.3.2 6-Mercaptopurine (10 marks)
- 5.3.3 Methotrexate (10 marks)
- 5.3.4 5-Fluorouracil (10 marks)
- 5.3.5 Hydroxyurea (10 marks)



52