UNIVERSITY OF JAFFNA, SRI LANKA

FACULTY OF MEDICINE

FIRST EXAMINATION FOR MEDICAL DEGREES (2^{ND}) - JUNE 2021

BIOCHEMISTRY PAPER II

(NEW CURRICULUM)

15.06.2021 Time: 3 Hours

Answer all 10 questions.

Marks allotted to each part are indicated in brackets.

Answer Each Ouestion on Se arate Answer Book.

1. 1.1 Explain diabetes mellitus

   1.1.1 Type I. (20 Marks)

   1.1.2 Type II. (20 Marks)

   1.2 Give the fasting blood glucose levels to confirm that a person is diabetic or pre-diabetic. (10 Marks)

   1.3 Name the test that is carried out to confirm gestational diabetes and explain how a pregnant woman can be prepared for the above mentioned test. (30 Marks)

   1.4 Explain how the glycosylated haemoglobin ($HbA1_C$) level is useful to consider the status of diabetes. (20 Marks)

2. 2.1 Diagrammatically show the formation and catabolism of VLDL. (35 Marks)

   2.2 Explain how cholesterol is catabolised. (25 Marks)

   2.3 Explain the mechanism of actions of

   2.3.1 Suiphonylurea (25 Marks)

   2.3.2 Statin (15 Marks)

3. 3.1 Explain the basic principles of the actions of different goitrogenic factors. (25 Marks)

3.2 Give examples for goitrogenic factors. (20 Marks)

3.3 Explain how the thyroid hormone is released from the thyroid gland and transported in the blood. (15 Marks)

3. 4 How the active form of thyroid hormone is formed in peripheral tissues? (15 Marks)

3.5 List the iodine deficiency disorders in adults, adolescents, children and neonates. (25 Marks)

4. 4.1 Explain the biochemical basis of

4.1.1 developing coma due to elevated blood ammonia level.

4.1.2 homocystinuria Type I. (50 Marks)

4.2 Explain how the cyanide poisoning is affecting the biochemical reactions. (20 Marks)

(30 Marks)

5. 5.1 The total seruna bilirubin level of a 45 year old male was 4mg / 100 ml blood and the urine contained bilirubin with decreased urobilinogen.

5.1.1 What could be the probable diagnosis? (05 Marks)

5.1.2 Which fraction of the serum bilirubin is elevated in this patient? (05 Marks)

5.1.3 List the probable causes for the elevation in the above said fraction of bilirubin in the above patient. (15 Marks)

5.1.4 Explain the biochemical basis for the elevation of the fraction of bilirubin said in Section 5.1.2 under the conditions mentioned in Section 5.1.3. (25 Marks)

5.1.5 What further test would you perform with blood to confirm your diagnosis? Give the principle of the test. (20 Marks)

5.2 Write short notes on cyclooxygenase -1 and Cyclooxygenase-2 inhibitors. (30 Marks)

6. 6.1 Give the biochemical basis of the followings.

6.1.1 Consuming cold water fish oil is better than consuming biitter. (25 Makes)

6.1.2 Amphipathic substances act as detergents. (20 Marks)

6.2 Give the serum electrophoretic pattern of a nephrotic syndrome patient comparing with that of a normal person. Explain the differences. (30 Marks)

6.3 The application of the isoenzyrnes of creative kinase for differential diagnosis of diseases. (25 Marks)

7. 7.1 Explain the role of bile in the digestion and absorption of fat. (20 Marks)

7.2 Give the functions of glycosaminoglycans? (15 Marks)

7.3 Diagrammatically show the glucose reabsorption mechanisms in kidney. (15 Marks)

7.4 Show how antibodies and memory cells are formed during immune response against an infection. (50 Marks)

8. 8.1 "More than 50% of the human cancers are associated with mutations in p53 gene" Explain. (30 Marks)

8.2 Explain with a diagram, how iron is absorbed into the intestinal epithelial cells ad stored. (30 Marks)

8.3 Glucose 6 phosphatase deficiency can lead to hyperuricemia. Explain. (40 Marks)

9. 9.1 Discuss the basis of developing microcytic and macrocytic anaemia after partial gastrectomy. (50 Marks)

9.2 Explain the biochemical functions of the following:

9.2.1 Vitamin K. (25 Marks)

9.2.2 Thiamine. (25 Marks)

10. A male security guard of 40year old is having 65kg body weight and 1.8m height.

10.1 Calculate the Basic Metabolic Rate (BMR) of the Security Guard. (25 Marks)

10.2 What is his physical activity level? Explain. (10 Marks)

10.3 Calculate his Total Energy Expenditure (TEE) per day. (15 Marks)

10.4 To maintain zero energy balance by the above male security guard,

10.4.1 What proportion of energy should be obtained from carbohydrates, proteins and lipids? (15 Marks)

10.4.2 Give a day's menu to obtain the above nutrients considering the 'Healthy eating plate concept'. (35 Marks)