UNIVERSITY OF JAFFNA, SRI LANKA

FACULTY OF ALLIED HEALTH SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION IN BScHons (Nursing)-2023

NURBN 1263 BIOCHEMISTRY FOR NURSES II

(16th 17th & 18th Batches)

PAPER-II

Date: 23.06.2025 **Time: 2 Hours**

Answer all the six questions.

Answer each part in separate answer books.

PART A

1. 1.1 **1.1.1** List the ingredients that should be added to collect the blood specimen to estimate the glucose. **(15 Marks)**

   1.1.2 Give the biochemical basis of using the ingredients mentioned in **Question 1.1.1.** **(25 Marks)**

   1.2 List the enzymes that catalyse the irreversible steps of glycolytic pathway and name the enzymes which help to overcome these respective irreversible steps in gluconeogenic pathway. **(20 Marks)**

   1.3 Write short notes on

   1.3.1 Galactosemia **(25 Marks)**

   1.3.2 Lactose intolerance **(15 Marks)**

2. 2.1 **2.1.1** Classify the dietary fibres based on their solubility giving three examples for each of the type of dietary fiber. **(25 Marks)**

   2.1.2 Explain the advantages of including fibers in the diet. **(35 Marks)**

   2.2 Explain the protein sparing action of carbohydrates. **(20 Marks)**

   2.3 Explain why cassava should be cooked in open vessels. **(20 Marks)**

3. 3.1 3.1.1 List the additional nutrients that are required to pregnant women.

(15 Marks)

3.1.2 Justify why the additional nutrient requirements listed in **Question 3.1.1** are essential to pregnant women.

(20 Marks)

3.2 List the conditions under which a mother should not breastfeed her infant.

(15 Marks)

3.3 3.3.1 Define malnutrition.

(10 Marks)

3.3.2 Explain the causes, complications and the consequences of marasmus.

(25 Marks)

3.3.3 List the diseases/ complications which can develop due to obesity.

(15 Marks)

4. 4.1 4.1.1 Define Basal Metabolic Rate (BMR).

(10 Marks)

4.1.2 List the factors that affect the BMR.

(25 Marks)

4.2 A 28-year-old female weighing 55 kg with 160 cm height does moderate level physical activity.

4.2.1 Calculate her BMR.

(20 Marks)

4.2.2 Estimate her Total Energy Expenditure (TEE).

(10 Marks)

4.3 4.3.1 List the methods that could be used to improve the nutritional quality of legumes.

(15 Marks)

4.3.2 Explain how the methods listed in **Question 4.3.1** could improve the nutritional quality of legumes.

(20 Marks)

PART B

5. 5.1 5.1.1 List two enzymes that can provide NADPH for fatty acid synthesis.

(10 Marks)

5.1.2 List the cells where the fatty acid synthesis is actively taking place.

(10 Marks)

5.1.3 List the hormones which would enhance the fatty acid synthesis.

(10 Marks)

5.1.4 Diagrammatically show the initiation step of fatty acid synthesis.

(30 Marks)

5.2 List three organs that are involved with cholesterol synthesis. **(10 Marks)**

5.3 Briefly explain the regulation of cholesterol synthesis,

5.3.1 by hormones and covalent modification. **(20 Marks)**

5.3.2 by feedback inhibition. **(10 Marks)**

PART C

6. 6.1 A 9-months-old child was brought to the clinic with generalised hypopigmentation, including pale skin, white hair and light - coloured irises. The parents reported that the child frequently squints with rapid involuntary eye movements (dancing eyes) and has sensitivity to sunlight. Laboratory investigations show normal plasma homocysteine and methionine levels.

6.1.1 What is the most likely diagnosis and the typical enzyme deficiency? **(15 Marks)**

6.1.2 Give the biochemical basis for the hypopigmentation observed with the metabolic pathway. **(25 Marks)**

6.2 What is meant by

6.2.1 *de novo* biosynthesis of purines. **(10 Marks)**

6.2.2 purine salvage pathway. **(10 Marks)**

6.3 List the organs where the *de novo* biosynthesis and salvage pathways of purine biosynthesis are taking place. **(15 Marks)**

6.4 Diagrammatically show the structure of tRNA and explain how the structure is suited for its function. **(25 Marks)**