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FACULTY OF ALLIED HEALTH SCIENCES

FIRST YEAR SECOND SEMESTER EXAMINATION IN BPharmHons-2023

PHABP 1222 BIOCHEMISTRY FOR PHARMACY 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 pathways which help to maintain the blood glucose level under fasting state along with the respective organs where the pathways are taking place. **(15 Marks)**

   1.1.2 Diagrammatically show how the insulin and glucagon helps to maintain the blood glucose level under fasting state with the organs where they involve with. **(45 Marks)**

   1.2 1.2.1 List the tests that could be performed to confirm that a person is diabetic. **(15 Marks)**

   1.2.2 List the expected ranges of the results of the tests mentioned in **Question 1.2.1** to confirm that a person is non-diabetic. **(25 Marks)**

2. 2.1 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)**

   2.2 Write short notes on

   2.2.1 Galactosemia **(25 Marks)**

   2.2.2 Lactose intolerance **(15 Marks)**

   2.3 Explain the post-translational modification of proteins taking insulin as an example. **(40 Marks)**

3. 3.1 3.1.1 Define Basal Metabolic Rate (BMR). **(10 Marks)**

3.1.2 List the factors that affect the BMR. **(25 Marks)**

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

3.2.1 Calculate her BMR. **(20 Marks)**

3.2.2 Estimate her Total Energy Expenditure (TEE). **(10 Marks)**

3.3 3.3.1 List the methods that could be used to improve the nutritional quality of legumes. **(15 Marks)**

3.3.2 Explain how the methods listed in **Question 3.3.1** could improve the nutritional quality of legumes. **(20 Marks)**

PART B

4. 4.1 What is meant by

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

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

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

4.3 4.3.1 Name three disease conditions that occurs due to increased purine biosynthesis. **(15 Marks)**

4.3.2 Explain how the increase in purine biosynthesis would have led to the disease conditions mentioned in **Question 4.3.1.** **(30 Marks)**

4.3 Explain with a diagram how the increase in purine biosynthesis would lead to gout. **(20 Marks)**

PART C

5. 5.1 List three organs that are involved with cholesterol synthesis. **(10 Marks)**

5.2 Briefly explain the regulation of cholesterol synthesis,

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

5.2.2 at the nuclear level. **(15 Marks)**

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

5.3 5.3.1 List two lipoproteins that mainly carry cholesterol. **(10 Marks)**

5.3.2 Diagrammatically show how the cholesterol is transported from liver to extrahepatic tissues. **(35 Marks)**

6. 6.1 6.1.1 List three conditions that would lead to elevated blood urea level. **(10 Marks)**

6.1.2 Name the reactions/ pathways that are involved in the detoxification of ammonia. **(10 Marks)**

6.1.3 Briefly explain the biochemical basis of neurological consequences of ammonia toxicity. **(25 Marks)**

6.2 6.2.1 List the genetic disorders that are associated with the defects in aromatic amino acids metabolism. **(15 Marks)**

6.2.2 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.

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

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