



UNIVERSITY OF RUHUNA
FACULTY OF AGRICULTURE

Second Examination in BSc Agricultural Resource Management and Technology/BSc
Agribusiness Management (Part II)

September 2020

FS2201 Food and Nutrition - Theory (Compulsory)

INSTRUCTIONS

Answer **five questions including question No. 1 and 2.**

Mobile phones are NOT permitted.

Attach the question paper to the **end** of the answer script

TIME: 3 (three) Hours

INDEX NUMBER

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- 1)
- a) Foods contain nutrients that perform certain functions. Briefly explain the types of nutrients and their specific functions in human metabolism. (25 marks)
 - b) Write a short account on regulation of blood glucose levels in human beings (25 marks)
 - c) Briefly explain the involvement of acetyl Co-A in human Metabolism (25 marks)
 - d) Briefly explain whether the fatty acid shown below can be synthesized in human body
$$\text{CH}_3 - (\text{CH}_2 - \text{CH} = \text{CH})_3 - (\text{CH}_2)_7 - \text{COOH}$$
 (25 marks)
- 2) Critically analyze the following statements. **State whether you agree or disagree with the statement**, and justify your answer with facts. (25 marks each)
- a) Digestion is an orderly catalytic process that requires the sequential action of a large number of enzymes
 - b) There is an enzyme involvement in preventing glycolysis while gluconeogenesis is taken place in a cell.
 - c) Normal human blood plasma contains all the amino acids required for the synthesis of body proteins, but not in equal concentrations, in which glutamine is such example where it is present in much higher concentrations than any other amino acids
 - d) Urea cycle is important in removal of both ammonia and carbon dioxide from the body
- 3)
- a) Briefly explain the mechanism of insulin mediated glucose uptake in to the cell and their possible conversions inside the cell (25 marks)
 - b) Name five groups of pathway enzymes and their functions in human metabolism (25 marks)
 - c) Explain the overall process of glycogenolysis (25 marks)
 - d) Briefly explain how galactose is metabolized in the cell? (25 marks)

- 4)
- a) Briefly describe the role of **carnitine** in fatty acid metabolism (25 marks)
 - b) Briefly describe the interrelation of fatty acid metabolism and carbohydrates metabolism (25 marks)
 - c) Describe the shuttle systems for transporting fatty acids into the mitochondria and acetyl CoA in to cytosol (25 marks)
 - d) Compare the energy cost in ATP equivalents of synthesizing stearate ($\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$) from mitochondrial acetyl-CoA and to the energy recovered by degrading stearate to acetyl CoA and to CO_2 separately (25 marks)
- 5)
- a) Amino acids can be categorized into **three** major groups according to the metabolic fate of their carbon skeleton. Briefly describe those three groups of amino acids with suitable examples. (25 marks)
 - b) Briefly explain the importance of transamination in protein metabolism (25 marks)
 - c) Discuss the importance of protein turnover in maintaining the body nitrogen balance in an equilibrium level (25 marks)
 - d) Analyze the importance of metabolism of phenylalanine in human body (25 marks)
- 6)
- a) Briefly explain the functions of bile in digestion of food (25 marks)
 - b) Briefly describe the contribution of **Large intestine** in digestion and absorption of food in human body (25 marks)
 - c) Write a short account on Anterior Pituitary gland hormones (25 marks)
 - d) Distinguish between Hyperthyroidism and Hypothyroidism (25 Marks)