

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: METABOLIC PROCESSES ISBB2102

JANUARY 2004

2 ½ HOURS (100 marks)

INSTRUCTIONS

Answer Five (5) Questions. Each question carries 20 marks. Where a question contains subdivisions, the mark value for each subdivision is given in brackets. Illustrate your answer where appropriate with large, clearly labelled diagrams.

1. Explain how reduced cofactors, NAD and FAD, are key intermediates in the bioenergetics of mitochondria.
2. Within your current understanding of metabolism of carbohydrates and fats, explain the key role played by the tricarboxylic acid cycle.
3. Discuss in detail the organization and functioning of pyruvate dehydrogenase.
4. Explain the importance of the pentose phosphate pathway and glycolysis in the metabolism of erythrocytes.
5. Describe in biochemical outline the synthesis and degradation of glycogen in the liver, then explain how these two processes are controlled and kept in balance in the tissue and in the cell.
6. a) Discuss the production of ketone bodies as possible products of fat catabolism and for the utilization of stored fat energy. (12 marks)
b) Propionate is a common volatile fatty acid produced by ruminants, outline how it is metabolized via the TCA cycle (8marks)
7. Explain the role of acetyl CoA carboxylase in the regulation and synthesis of fatty acids in mammalian systems.
8. Give the sites of triglyceride synthesis in the mammalian body and outline the pathway involved.

END OF EXAMINATION

Id no's