NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

BACHELOR OF SCIENCE HONOURS DEGREE EXAMINATIONS

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

THEORY: ADVANCED BIOCHEMISTRY AND MOLECULAR PHYSIOLOGY SBB 4101

DECEMBER 2004

3 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. Describe the motifs found in protein folding and explain how this may be driven from the primary structure of the nascent protein.

2.(a) Define the meaning of autocrine, paracrine and endocrine systems. (10 marks)

(b) Outline the range of cell signalling processes that allow external signals to affect internal cell processes. (10 marks)

3. Detail the hormones that can effect glucose & carbohydrate metabolism in the body and outline their activity in relation to the body's nutritional or stress status.

4. Describe the organisation and operation of the G-protein complex in the signal transduction process.

5.(a) Illustrate how proteases can be classified by the nature of the catalytic site and consequent mechanism. (15marks)

(b) Explain how chymotrypsin fits into this classification and where the enzyme's specificity resides. (5 marks)

6. Outline the process of blood clot formation and the role of Vitamin K in the process.

7. Explain the molecular basis of the action potential in neurotransmission and relate this to the activity of the acetyl choline receptor.

8. Explain the organisation of the proteins involved in muscle contraction, with particular reference to skeletal muscle fibres, and the molecular basis of muscle contraction.

9. Classify and describe the types of filaments found in non-muscle eukaryotic cells in relation to the molecular and cellular processes.

END OF EXAMINATION

odd no's