

UNIVERSITY OF SWZAILAND

MAIN EXAMINATION PAPER MAY 2006

TITLE OF PAPER: BIOCHEMISTRY AND CELL BIOLOGY

COURSE CODE: B203

TIME ALLOWED: THREE HOURS

INSTRUCTIONS: 1. ANSWER ANY FOUR QUESTIONS.
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
3. ILLUSTRATE YOUR ANSWERS WITH LARGE AND CLEARLY LABELLED DIAGRAMS WHERE APPROPRIATE.

SPECIAL REQUIREMENTS:

NONE

THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATORS.

QUESTION 1

- (a) Using glucose, sucrose and starch as examples, describe the structure and properties of carbohydrates. (18 marks)
- (b) Explain the formation of ring structures in monosaccharides. (7 marks)
- [25 Marks]

QUESTION 2

- (a) Discuss the nature and importance of lipids, with special reference to saturated and unsaturated fatty acids. (18 marks)
- (b) Explain the importance of co-enzyme A in metabolism. (7 marks)
- [25 Marks]

QUESTION 3

- (a) What is meant by:-
- (i) An enzyme activator
 - (ii) An enzyme inhibitor
 - (iii) An allosteric effector. (10 marks)
- (b) Explain with appropriate examples the differences between the primary, secondary, tertiary and quaternary structures of proteins. (15 marks)
- [25 Marks]

QUESTION 4

- (a) What are nucleic acids? (5 marks)
- (b) Discuss the differences between RNA and DNA with references to their structures, locations and functions in eukaryotic cells. (20 marks)
- [25 Marks]

QUESTION 5

- (a) What is metabolism? (5 marks)
- (b) In respiration the energy contained in a molecule of glucose is made available to aerobic cells /organisms by these: glycolysis, tricarboxylic acid cycle, electron-transfer system and oxidation phosphorylation. Briefly explain the essential features of each of these processes. (20 marks)
- [25 Marks]

QUESTION 6

- (a) Discuss the light reactions of photosynthesis and briefly explain what happens to the products of these reactions (25 Marks)