UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER: DECEMBER 2010

TITLE OF PAPER: BIOCHEMISTRY & 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 SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATORS

[PLEASE TURN OVER]

Question 1

(a) What are glycans? (5 marks)

(b) Using examples, write explanatory notes on the following carbohydrates:
(i) simple, (4 marks)
(ii) storage, (4 marks)
(iii) structural. (4 marks)

(c) With reference to disaccharides, explain the difference between reducing and non-reducing sugars. (8 marks)

[TOTAL MARKS = 25]

Question 2

(a) Name the most common chemical component of hydrolysable lipids and briefly describe its structure, properties and functions in biological systems. (15 marks)

(c) Explain the significance of acetyl co-enzyme A in metabolism. (10 marks)

[TOTAL MARKS = 25]

Question 3

(a) Using examples, distinguish between conjugated, fibrous and globular proteins. (9 marks)

(b) With reference to proteins, explain the term "conformation" and briefly describe the various levels of protein structure. (16 marks)

[TOTAL MARKS = 25]

Question 4

(a) Name the various classes of enzyme and briefly explain the function of each in biochemical reactions. (12 marks)

(b) What are enzyme inhibitors? Explain how a nerve gas and penicillin inhibit the action of enzymes. (13 marks)

[TOTAL MARKS = 25]

Question 5

(a) What are the starting materials and products of glycolysis? Briefly explain the fate of the products in metabolism. (13 marks)

(b) Explain how the Krebs cycle generates CO_2, ATP, NADH and $FADH_2$. (12 marks)

[TOTAL MARKS = 25]

Question 6

Write concise notes on any **two** of the following:
(a) Nucleic acids and protein synthesis, (12½ marks)
(b) Dark reactions of photosynthesis, (12½ marks)
(c) Gluconeogenesis. (12½ marks)

[TOTAL MARKS = 25]

END OF QUESTION PAPER