

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER: JULY 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 polysaccharides? (5 marks)
- (b) With reference to named disaccharides, explain the difference between condensation and hydrolysis. (10 marks)
- (c) Explain mutarotation in monosaccharides. (10 marks)

[TOTAL MARKS = 25]**Question 2**

- (a) Outline the structural features and properties of the common fatty acids. (10 marks)
- (b) Write a brief essay on the importance of lipids to living organisms, especially vertebrates. (15 marks)

[TOTAL MARKS = 25]**Question 3**

- (a) Name the monomeric units of proteins and briefly describe the general chemical structure and various properties of these units. (10 marks)
- (b) Two major products are obtained from the catabolism of the monomeric units in (a) above. Name these products and briefly explain what happens to them in metabolism. (15 marks)

[TOTAL MARKS = 25]**Question 4**

- (a) Using examples, explain the role of co-factors during enzyme catalysis. (10 marks)
- (b) Explain how temperature and pH affect enzyme activity in biological systems. (15 marks)

[TOTAL MARKS = 25]**Question 5**

- (a) Describe in detail the various steps leading to the complete oxidation of pyruvate to carbon dioxide and water in aerobic organisms. (17 marks)
- (b) Briefly explain the significance of ATP in cell metabolism. (8 marks)

[TOTAL MARKS = 25]**Question 6**

Write concise notes on the following processes, highlighting their importance to eukaryotic organisms:

- (a) Pentose-Phosphate pathway, (13 marks)
- (b) The Calvin Cycle. (12 marks)

[TOTAL MARKS = 25]**END OF QUESTION PAPER**