UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER: MAY 2012

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 ANSWER 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) What are biomolecules? (6 marks)

(b) With reference to monosaccharides, explain the following:
(i) condensation, (4 marks)
(ii) hydrolysis, (4 marks)
(iii) mutarotation. (4 marks)

(c) Outline the functions of carbohydrates in living organisms. (7 marks)

[Total marks = 25]

Question 2

(a) Outline the structural features and properties of simple fatty acids. (8 marks)

(b) Explain with examples the differences between saturated and unsaturated fatty acids. (7 marks)

(c) Briefly discuss the importance of proteins in living organisms. (10 marks)

[Total marks = 25]

Question 3

(a) What are nucleotides? (7 marks)

(b) Discuss the roles played by nucleic acids in the biosynthesis of proteins in living cells. (18 marks)

[Total marks = 25]

Question 4

(a) With reference to enzymes, explain the following:
(i) co-factors, (3 marks)
(ii) allosteric effectors, (3 marks)
(iii) inhibitors. (4 marks)

(b) Briefly explain how heavy metals (e.g. lead), poisons (e.g. salts of cyanide) and pesticides (e.g. DDT) affect the action of enzymes in living organisms. (15 marks)

[Total marks = 25]

Question 5

(a) Distinguish between light and dark reactions of photosynthesis. (9 marks)

(b) Briefly explain how adenosine triphosphate (ATP) is generated and utilized by the cells of green plants (16 marks)

[Total marks = 25]

Question 6

Write concise notes **on two** of the following:

(a) The fate of the end products of glycolysis, (12½ marks)

(b) β-oxidation and its significance to eukaryotes, (12½ marks)

(c) Gluconeogenesis. (12½ marks)

[Total marks = 25]

END OF QUESTION PAPER