UNIVERSITY OF SWAZILAND

MAIN EXAMINATION PAPER 2006

TITLE OF PAPER: INTRODUCTORY BOTANY

COURSE CODE: B111

TIME ALLOWED: THREE HOURS

INSTRUCTIONS:

1. ANSWER QUESTION 1 AND ONE OTHER QUESTION FROM SECTION A. ANSWER ANY TWO QUESTIONS FROM SECTION B.
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

SECTION A

ANSWER QUESTION 1 AND ONE OTHER QUESTION IN THIS SECTION

QUESTION 1

a. State three functions that may be served by proteins in the cell. **[3 Marks]**
b. State three functions of cholesterol. **[3 Marks]**
c. What name is given to the following:

i. A molecule composed of a pentose sugar and a nitrogenous base
ii. A nitrogenous base composed of two interlocked rings
iii. A bond between two cysteine residues
iv. A mass of long, inter-twined tread-like structures in the nucleus
v. The proteins that make up the nuclear pores **[5 Marks]**

d. What cell parts fit the following descriptions:

i. A stack of flattened membranes
ii. A cottage-loaf shaped structure composed of two subunits
iii. A dark staining body on the nucleus
iv. The power house of the cell
v. The digestive plant of the cell. **[5 Marks]**

e. State three types of interactions or bonds that are important in maintaining the tertiary level of protein structure. **[3 Marks]**

f. Distinguish between cofactors and coenzymes **[2 marks]**.

g. Label parts A and B in the following diagram. **[2 Marks]**

h. State two functions of the organelle shown in the figure. **[2 marks]**

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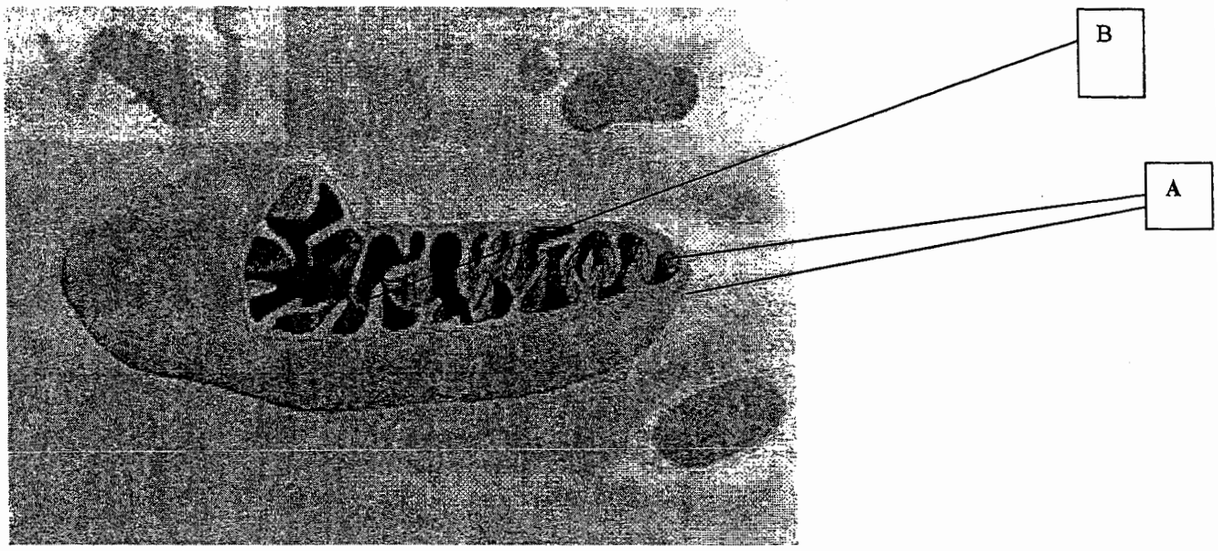

QUESTION 2

a) Compare and contrast between starch and glycogen. **[5 Marks]**

b) With the aid of large, clearly labeled diagrams, explain how phospholipids are formed. **[5 Marks]**

c) Explain fully what is meant by a fluid mosaic, illustrating your answer with large, fully labeled diagrams. **[15 Marks]**

[TOTAL 25 MARKS]

QUESTION 3

a) Explain how enzymes are named and classified using specific examples to illustrate your answer. **[4 Marks]**

b) Explain fully, how enzymes act to enhance the rate of reaction. **[5 Marks]**

c) With the aid of large, fully labeled diagrams where appropriate, discuss the following:

i. Non-competitive inhibition
ii. Allosteric factors
iii. Effect of temperature on enzyme action
iv. The secondary level of protein structure **[16 Marks]**

[TOTAL 25 MARKS]

SECTION B

INSTRUCTIONS: Answer any TWO (2) questions from this section.

QUESTION 4

a) What are the criteria that are used to separate algae into phyla and/or divisions? (3 marks)

b) Draw the following:
(i) a diatom (3 marks)
(ii) a green algae (3 marks)
(iii) a brown algae (3 marks)
(iv) an euglenoid (3 marks)

c) Demonstrate that a common rock weed undergoes both haploid and diploid life cycles. (4 marks)

d) Give an account of the economic importance of algae. (6 marks)

[Total Marks = 25]

QUESTION 5

a) Define a virus. (5 marks)

b) Write brief notes on the following:
(i) effects of virus infection on cells (5 marks)
(ii) bacteriophages (5 marks)
(iii) viral replication (5 marks)
(iv) viral transmission (5 marks)

[Total Marks = 25]

QUESTION 6

a) Draw a well labeled diagram of a typical cell of a bacterium. (5 marks)

b) What is conjugation in bacteria? Elaborate. (3 marks)

c) Define the following terms:

(i) psychrophiles (2 marks)

(ii) mesophiles (2 marks)

(iii) thermophiles (2 marks)

d) Distinguish between the following:

(i) aerobes and anaerobes (2 marks)

(ii) autotrophic bacteria and heterotrophic bacteria. (4 marks)

e) Explain a typical growth curve of a bacterium. (5 marks)

[Total Marks = 25]