

**UNIVERSITY OF SWAZILAND**

**MAIN EXAMINATION PAPER: DECEMBER 2008**

**TITLE OF PAPER:**           INTRODUCTORY BOTANY

**COURSE CODE:**            B111

**TIME ALLOWED:**         THREE HOURS

- INSTRUCTIONS:**
1. THIS PAPER IS DIVIDED INTO TWO SECTIONS
  2. ANSWER 2 QUESTIONS FROM EACH SECTION IN TWO SEPARATE BOOKLETS.
  3. ANSWER QUESTION 1 (COMPULSORY) AND ONE OTHER QUESTION FROM SECTION A.
  4. ANSWER ANY TWO QUESTIONS FROM SECTION B.
  5. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS
  6. 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**

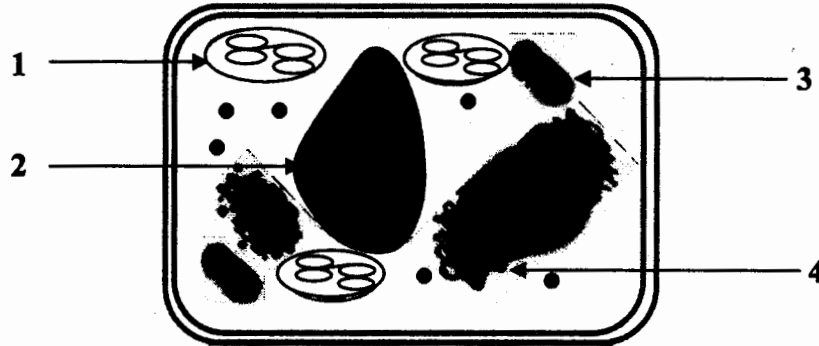
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SECTION A

ANSWER QUESTION 1 AND ONE OTHER QUESTION FROM THIS SECTION.

Question 1 (COMPULSORY)

- (a) Study the plant cell shown below. Identify the organelles numbered 1 to 4 and explain their cellular functions. (8 marks)



- (b) Using a clearly labeled diagram, describe the fluid mosaic model of plasma membrane. (8 marks)
- (c) Explain the structural and functional differences between DNA and RNA. (6 marks)
- (d) Differentiate between a nucleoside and a nucleotide. (3 marks)
- [TOTAL MARKS = 25]

Question 2

- (a) Discuss the functions, deficiency and toxicity the following plant nutrients:
- (i) Nitrogen; (4 marks)
  - (ii) Phosphorous; (3 marks)
  - (iii) Potassium. (3 marks)
- (b) Briefly explain the role of the following hormones during plant growth and development:
- (i) Abscisic acid; (3 marks)
  - (ii) Gibberelins; (3 marks)
  - (iii) Auxins; (3 marks)
  - (iv) Cytokinins; (3 marks)
  - (v) Ethylene. (3 marks)
- [TOTAL MARKS = 25]

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**Question 3**

- (a) Relate the structure of glycerophospholipids with their biological function in plasma membranes. (10 marks)
- (b) Describe the mechanisms of facilitated diffusion and active transport of metabolites across plasma membranes. (10 marks)
- (c) Describe the primary structure of proteins. (5 marks)

**[TOTAL MARKS = 25]****SECTION B****ANSWER ANY TWO (2) QUESTIONS FROM THIS SECTION.****Question 4**

- (a) Draw the following:
- |        |                  |            |
|--------|------------------|------------|
| (i)    | a perithecium    | (1½ marks) |
| (ii)   | an apothecium    | (1½ marks) |
| (iii)  | a cleistothecium | (1½ marks) |
| (iv)   | a pycnidium      | (1½ marks) |
| (v)    | an acervulus     | (1½ marks) |
| (vi)   | a basidiocarp    | (1½ marks) |
| (vii)  | a diatom         | (1½ marks) |
| (viii) | a green algae    | (1½ marks) |
| (ix)   | a brown algae    | (1½ marks) |
| (x)    | an euglenoid     | (1½ marks) |
- (b) Explain the economic importance of fungi and algae. (10 marks)

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

- (a) Draw a well labelled diagram of a bacterium. (5 marks)
- (b) What are the shapes of bacteria? Elaborate. (3 marks)
- (c) Given that the optimal conditions for bacterial growth are never met, explain the typical growth curve of a bacterium. (8 marks)
- (d) Write an essay on "bacteria useful to humans". (9 marks)

**[TOTAL MARKS = 25]****[PLEASE TURN OVER]**

**Qquestion 6**

- (a) Give a technical definition of a virus. (5 marks)
- (b) Draw the following:
- (i) a retrovirus (1½ marks)
  - (ii) a bacteriophage (1½ marks)
  - (iii) a rigid rod shaped virus (1½ marks)
  - (iv) an icosahedral virus (1½ marks)
- (c) Explain how viruses reproduce within cells. (5 marks)
- (d) What is the relevance of viruses to humans? Elaborate. (9 marks)

**[TOTAL MARKS = 25]**

**END OF QUESTION PAPER**