CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF EDUCATION SCEINCE, BACHELOR OF SCIENCE IN MICROBIOLOGY AND BIOTECHNOLOGY

BOTA 271: PLANT PHYSIOLOGY 1

STREAMS:

INSTRUCTIONS:

- **Answer ALL questions in section A and TWO questions in section B**
- **Do not write on the question paper**
- **Answer each question on a fresh page**

SECTION A: SHORT ANSWER QUESTIONS (30 MARKS)

1. Differentiate between the following terms as applied in plant physiology (5 marks)
   a. Saturated or unsaturated fatty acids
   b. Co-factor and co-enzyme
   c. Suspension and colloidal solutions
   d. Simple and facilitated diffusion
   e. Symplastic and apoplastic water pathways

2. a. Illustrate using the chemical structure, the difference between aldose and ketose sugars (3 marks)

   b. Outline two roles of pectin in plants (2 marks)

3. a. Identify the organelle in Figure 1 (1 mark)

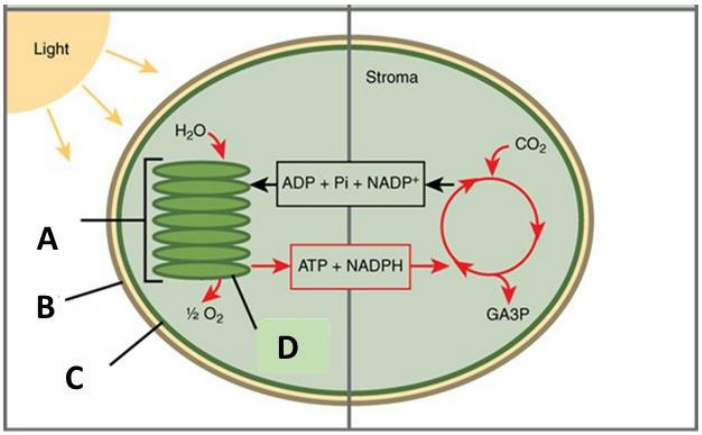

Figure 1

b. Identify the parts labelled A, B, C & D (2 marks)

c. Explain two events that take place in the second phase of the process illustrated in Figure 1 (2 marks)

4. Explain five ways in which auxin hormone can be used to optimize plant growth and improve crop yields (5 marks)

5. a. Describe two events that happens during glycolysis process of respiration (2marks)

   b. Explain three factors that affect the process of respiration in plant cells (3 marks)

6. a. Name the minerals responsible for the following physiological processes (3marks)
   i. Synthesis of chlorophyll molecules
   ii. Transfer of energy (ATP)
   iii. Synthesis of nucleic acid

   b. using relevant examples explain the difference between macronutrients and micronutrients (2 marks)

SECTIO N B: ESSAY QUESTIONS (40 MARKS)

7. Discuss the roles of aqueous solutions in plant physiology (20 marks)

8. a. Describe the mechanisms of enzymatic action in plant (10 marks)

   b. Discuss intrinsic factors that influence enzymatic activity in plant cells (10 marks)

9. Discuss the three theories of water transportation in plant (20 marks)