



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (BIOLOGY)

SBT 310: PLANT BIOCHEMISTRY AND PHYSIOLOGY

DATE: 13/11/2020

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

1. Answer Question 1 (compulsory) and **any two** questions in Section B.
2. Use clean well labelled diagrams wherever appropriate.

SECTION A: COMPULSORY

QUESTION ONE (30 MARKS)

- a) Describe three properties of amino acids (3 marks)
- b) Describe a simple laboratory test for lipids. (3 marks)
- c) Explain the role of the following enzymes:-
 - i) Sucrose phosphorylase (1.5 marks)
 - ii) Sucrose phosphate synthetase (1.5 marks)
- d) Describe reductive amination using an example (3 marks)
- e) Describe biological nitrogen fixation (3 marks)
- f) Explain three physiological effects of auxins in plants (3 marks)
- g) Distinguish between DNA and RNA (3 marks)
- h) Explain the term 'oxidative phosphorylation' (3 marks)
- i) Explain the significance of NADH and FADH (3 marks)
- j) Briefly describe the following physiological responses and their importance in plants:-
 - i) Photoperiodism (1.5 marks)
 - ii) Vernalization (1.5 marks)

SECTION B: ANSWER ANY TWO QUESTIONS (40 MARKS)

QUESTIONS TWO (20 MARKS)

Discuss starch biosynthesis

QUESTION THREE (20 MARKS)

- a) Differentiate between C_3 and C_4 pathways (5 marks)
- b) Describe the carbon assimilation pathway in C_4 plants (15 marks)

QUESTION FOUR (20 MARKS)

Describe β - oxidation of fatty acids

QUESTION FIVE (20 MARKS)

Discuss transcription and translation in protein biosynthesis