



MACHAKOS UNIVERSITY

University Examinations for 2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

THIRD YEAR SUPPLEMENTARY/SPECIAL EXAMINATION EXAMINATION FOR

BSC. BIOLOGY & BSC. AGRICULTURAL EDUCATION & EXTENSION

SBT 310: PLANT BIOCHEMISTRY & PHYSIOLOGY

DATE: 8/3/2023

TIME : 2.00 – 4.00 PM

INSTRUCTIONS

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

QUESTION ONE (30 MARKS)

- a) Differentiate granum and chlorophyll (3 Marks)
- b) Describe any three natural plant hormones and their role(s) (3 Marks)
- c) With examples, outline five principal biomolecules studied in plant biochemistry (3 Marks)
- d) Define lipid metabolism and lipogenesis process (3 Marks)
- e) Describe the basic components/bases of the two major nucleic acids (3 Marks)

- f) Define heterotrophs and polysaccharide (3 Marks)
- g) Outline the major functions of L-ascobic acid and its deficiency in man (3 Marks)
- h) Explain gluconeogenesis and vernalization in higher plants (3 Marks)
- i) Briefly explain photoperiodism in plants (3 Marks)
- j) Draw and label the cross-section structure of chloroplast. (3 Marks)

QUESTIONS TWO (20 MARKS)

- a) Briefly discuss the fate of absorbed glucose in the animal body. (10 Marks)
- b) Briefly explain the biosynthesis of phytohormones and their mode of action. (10 Marks)

QUESTIONS THREE (20 MARKS)

- a) Discuss in detail the assimilation of nitrogen by plants (10 Marks)
- b) Briefly explain lipid metabolism (10 Marks)

QUESTIONS FOUR (20 MARKS)

Basically C₄ and CAM photosynthesis processes are the same. Discuss (20 Marks)

QUESTIONS FIVE (20 MARKS)

Discuss response of plants to phytochrome systems and photoperiodism (20 Marks)