



MACHAKOS UNIVERSITY

University Examinations 2022/2023 academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION (SCIENCE)

SBT 405: MORPHOGENESIS & DEVELOPMENTAL ANATOMY

DATE:

TIME:

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) Briefly describe three ways in which zygotic and somatic embryos differ. (3 marks)
- b) Briefly explain three morphogenetic changes that occur during leaf development. (3 marks)
- c) Explain the importance of morphogenesis in a developing plant. (3 marks)
- d) Explain briefly the function of three hormones produced during fruit development. (3 marks)
- e) Briefly describe the mechanism that could cause sibling cells to adopt different developmental fates in an embryo. (3 marks)
- f) Describe the meristematic activities in the shoot apical meristem (SAM) (3 marks)
- g) Illustrate the T/S of an anther (3 marks)
- h) Illustrate and describe anatomical differences between roots and stems. (3 marks)
- i) Briefly describe the process of cell plate formation. (3 marks)
- j) Briefly explain what would happen if an epidermal cell was inserted between cortical cell. (3 marks)

SECTION B : ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 MARKS)

Discuss leaf morphogenesis and development in higher plants.

QUESTION THREE (20 MARKS)

- a) Discuss in detail the secondary thickening in dicot stems. (10 marks)
- b) Briefly describe the life cycle of a flowering plant (10 marks)

QUESTION FOUR (20 MARKS)

Describe the embryonic development of a plant, as exemplified by *Arabidopsis thaliana*.

QUESTION FIVE (20 MARKS)

- a) Describe in detail the endosperm formation in angiosperms. (10 marks)
- b) Briefly discuss gametogenesis in general male development in plants. (10 marks)