



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF EDUCATION IN SCIENCE

SBT 405: MORPHOGENESIS AND DEVELOPMENTAL ANATOMY

DATE: 9/12/2021

TIME: 11.00-1.00 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) Define the following terms with respect to plant development and morphogenesis (3 marks)
 - i. Growth
 - ii. Totipotency
 - iii. Differentiation
- b) Illustrate the structure of an ovule (3 marks)
- c) Describe the process of double fertilization in angiosperms (3 marks)
- d) Describe three major challenges of embryogenesis (3 marks)
- e) Explain three types of endosperms (3 marks)
- f) Describe the structural components of the cell wall (3 marks)
- g) Describe the structure of Root Apical Meristem (3 marks)
- h) Outline any three characteristics of meristematic cells (3 marks)
- i) Explain three patterns of phyllotaxy in plants (3 marks)
- j) Describe two factors affecting lateral root initiation (3 marks)

SECTION B: ANSWER ANY OTHER TWO QUESTIONS

QUESTION TWO (20 MARKS)

Discuss Organizations in Shoot Apical Meristems

QUESTION THREE (20 MARKS)

Discuss leaf formation

QUESTION FOUR (20 MARKS)

- a) Discuss cell plate formation (15 marks)
- b) Explain the importance of plant cell walls (5 marks)

QUESTION FIVE (20 MARKS)

Discuss the gametogenesis processes