



# MACHAKOS UNIVERSITY

University Examinations 2021/2022

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF PHYSICAL SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR  
BACHELOR OF EDUCATION IN SCIENCE

SBT 405: MORPHOGENESIS AND DEVELOPMENTAL ANATOMY

DATE: 16/3/2022

TIME: 2:00 – 4:00 PM

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## Instructions

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

## SECTION A

### Question 1

- i. Define the following terms with respect to plant development and morphogenesis (3 marks)
  - a. Morphogenesis
  - b. Determination
  - c. Totipotency
- ii. Describe haplodiplontic life cycle in higher plants (3 marks)
- iii. State any three classes of genes which control flowering in plants (3 marks)
- iv. Highlight any three functions of the suspensor formed in the assymmetric cell division stage of plant embryonic development (3 marks)
- v. Distinguish between nuclear and helobial types of endosperms (3 marks)
- vi. Describe how somatic embryogenesis can be induced in higher plants (3marks)
- vii. Outline the roles of Pre-prophase Band in cell plate formation (3 marks)
- viii. Discuss any three characteristics of Apical Meristems (3 marks)
- ix. Describe the layer organization of Shoot Apical Meristem (3 marks)
- x. Discuss the events in primary morphogenesis phase of leaf formation (3 marks)

## **SECTION B**

### **Question 2**

Discuss secondary growth of shoots (20 Marks)

### **Question 3**

- a. Describe three stages in cell plate formation (15 marks)
- b. Discuss any five functions of plant cell walls (5 marks)

### **Question 4**

Discuss the various steps involved in leaf formation (20 Marks)

### **Question 5**

Discuss the stages/events of plant embryogenesis (20 marks)