



# KENYATTA UNIVERSITY

## UNIVERSITY EXAMINATIONS 2010/2011

### SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (CROP IMPROVEMENT AND PROTECTION) AND BACHELOR OF SCIENCE (AGRICULTURE)

#### KST 111: PLANT GROWTH AND DEVELOPMENT

DATE: Thursday 31<sup>st</sup> March, 2011

TIME: 11.00 a.m – 1.00 p.m

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#### INSTRUCTIONS

*Answer ALL Questions in Section A and any Two Questions in Section B*

#### Section A (40 Marks)

1. (a) Distinguish between **anticlinal** and **periclinal** divisions. (2 marks)  
(b) Explain the role of phosphorous nutrition in periclinal division. (3 marks)
2. Discuss mechanism(s) that explain shapes of primordia of agricultural crops. (5 marks)
3. (a) Differentiate between **monocarpic** and **polycarpic** species. (1 mark)  
(b) Explain the growth pattern of beet (*Beta vulgaris*) and carrot (*Daucus carota*) in temperate and semi-arid tropical conditions respectively, pointing out effects of  $\text{Na}^+$  and  $\text{K}^+$  on growth patterns of both crops. (4 marks)
4. (a) Define the term **phyllotaxy** (1 mark)  
(b) Name two types of phyllotaxes and explain one theory behind phyllotaxy. (4 marks)

5. (a) Define the term **statocyte**. (1 mark)
- (b) Give two supporting evidence to suggestion that **amyloplast** is an organelle of gravity perception. (4 marks)
6. (a) Explain solar tracking mechanism and its role in crop growth and development. (3 marks)
- (b) Explain circumstance (s) under which “negative solar tracking” may be desirable. (2 marks)
7. Discuss climacteric ripening, pointing out the role of external factors in this process. (5 marks)
8. Citing relevant examples, explain the role of external factors on bud dormancy, giving emphasis on the significance of bud dormancy in agriculture. (5 marks)

Section B (30 Marks)

9. Discuss the formation of lateral and growth of radial roots. (15 marks)
10. Discuss seed germination, seedling establishment, pointing out external and inherent factors that affect these processes. (15 marks)
11. Discuss relations between vegetative and reproductive growth, and explain how these phases can be manipulated for benefit of growers. (15 marks)
12. Briefly discuss factors that regulate senescence and abscission of plant organs, pointing out the significance of the processes to crop plants and farmers. (15 marks)