

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF DOCTOR
OF PHILOSOPHY IN BOTANY

BOTA 972: PLANT GROWTH AND DEVELOPMENT

STREAMS: PhD (Y1S2)

TIME: 3 HOURS

DAY/DATE: FRIDAY 07/12/2018

2.30 P.M. – 5.30 P.M.

INSTRUCTIONS:

- Answer any **THREE** questions
- Candidates are advised not to write on question paper
- Candidates must hand in their answer booklets to the invigilator while in the examination room

QUESTION ONE (20 MARKS)

- (a) Discuss the theories for morphogenesis of the shoot and root apices in plants. [10 marks]
- (b) Describe the process of formation of lateral roots in plants. [5 marks]
- (c) Explain root secondary growth in gymnosperms and dicots. [5 marks]

QUESTION TWO (20 MARKS)

- (a) Assess the significance of the following structures in plant growth;
- (i) Mycorrhizae [4 marks]
- (ii) Root nodules [3 marks]
- (b) Outline the root-stem transition mechanisms in Curcubita sp., Mirabilis sp. and Medicago sp. [13 marks]

QUESTION THREE (20 MARKS)

- (a) Discuss the structure and development of cork in plant stems. [10 marks]
- (b) Lenticles are restricted areas of loosely arranged cells in the plant periderm. Discuss their structure and functions according to Wutz (1955). [10 marks]

QUESTION FOUR (20 MARKS)

- (a) Describe anomalous secondary growth in Draceana sp. [5 marks]
- (b) Explain the structure and functions of the following plant secretory tissues:
- (i) Trichomes [3 marks]
 - (ii) Digestive glands [3 marks]
 - (iii) Salt glands [3 marks]
 - (iv) Floral Nectaries [3 marks]
- (c) Distinguish between articulated and non-articulated laticifers. [3 marks]

QUESTION FIVE (20 MARKS)

- (a) Discuss the ontogeny and development of pollen grains. [5 marks]
- (b) Describe the process of fertilization and embryo-sac development. [10 marks]
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