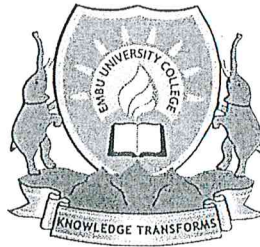


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EMBU UNIVERSITY COLLEGE  
(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)

FIRST SEMESTER EXAMINATIONS 2013/2014

FIRST YEAR EXAMINATION FOR THE DEGREE OF SCIENCE IN  
AGRICULTURE/HORTICULTURE/RANGE MANAGEMENT/AGRICULTURAL  
EDUCATION AND EXTENSION

ACS 104/AEX 102: PLANT/CROP PHYSIOLOGY

DATE: DECEMBER 5, 2013

TIME: 2.00 – 4.00 PM

INSTRUCTIONS:

Answer Question ONE and ANY Other TWO Questions.

QUESTION ONE

- a) Define the following terms:
- i.) Photoperiodism (1 mark)
  - ii.) Phytochrome (1 mark)
  - iii.) Photosynthesis (1 mark)
  - iv.) Photoinhibition (1 mark)
- b) Draw a well labeled diagram of the shoot meristem (5marks)
- c) Explain the concept of double fertilization in flowering plants (3marks)
- d) Photosynthesis is an oxidation-reduction process. Discuss (4marks)
- e) Differentiate between:
- i.) Epigeal and hypogeal germination (2marks)
  - ii.) Coleoptile and hypocotyl (2marks)
- f) Water stress is a persistent threat to plant survival. Discuss (5marks)
- g) State two properties of enzymes (2marks)
- h) Name three factors affecting enzyme activity (3marks)

### QUESTION TWO

- a) Draw the structure of Indole-3-acetic acid (IAA) (2marks)
- b) Describe the synthesis of IAA from tryptophan (8marks)
- c) Explain the deactivation of the following plant hormones *in situ*
- i.) Auxins (5marks)
  - ii.) Cytokinins (5marks)

### QUESTION THREE

- a) Give a brief outline of the functions and deficiency symptoms of the following mineral elements in plants:
- i.) Nitrogen (6 marks)
  - ii.) Magnesium (4 marks)
- b.) Discuss five soil factors affecting absorption of water by plants (10 marks)

### QUESTION FOUR

- a) Summarize the Krebs cycle in the mitochondria of eukaryotic organisms (10 marks)
- b) Explain the factors affecting the rate of respiration in plants (10 marks)

### QUESTION FIVE

Describe the following in relation to flowering plants:

- [i]. Alteration of generations in flowering plants (6 marks)
- [ii]. The formation of a mega-spore (6 marks)
- [iii]. The formation of a microspore (4 marks)
- [iv]. The difference between male sterility and self-incompatibility (4 marks)

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