



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURAL EDUCATION AND EXTENSION

SECOND/FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

SBT 102: PLANT PHYSIOLOGY

DATE: 3/5/2019

TIME: 2:00 – 4:00 PM

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## INSTRUCTION:

Answer Question One And Any Other Two Questions

### QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Define the following terminologies:-
- i) Translocation (1 mark)
  - ii) Respiration (1 mark)
  - iii) Respiration quotient (1 mark)
- b) Describe the classifications of Carbohydrate. (3 marks)
- c) Describe five functions of carbohydrates in plants (5 marks)
- d) Describe the differences between diffusion and osmosis (5 marks)
- e) Explain the following soil water constants: -
- i) Field capacity (1 mark)
  - ii) Saturation capacity (1 mark)
  - iii) Permanent wilting point (1 mark)
- f) Describe water potential and its components, in relation to plant-water relationships. (3 marks)
- g) State the factors that affect transpiration in plants (3 marks)
- h) Describe the general properties of aqueous solutions (5 marks)

**QUESTION TWO (20 MARKS)**

Describe the following two processes involved in photosynthesis: -

- i) Light reaction (10 marks)
- ii) Calvin's cycle (light independent reaction) (10 marks)

**QUESTION THREE (20 MARKS)**

- a) Discuss the process of pyruvic acid production (Pyruvic cycle), during respiration in plants. (10 marks)
- b) Describe the Krebs cycle (Citric acid cycle ) (10 marks)

**QUESTION FOUR (20 MARKS)**

- a)
  - i) Describe the structure of proteins (4 marks)
  - ii) Describe the classifications of proteins (8 marks)
- b) Describe the biological functions of proteins. (8 marks)

**QUESTION FIVE (20 MARKS)**

- a) Describe the two pathways of water movements in plants. (5 marks)
- b) Describe the similarities and differences of the two pathways in (i) above. (5 marks)
- c) Discuss the role of hormones in plant growth and development (10 marks)