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University Examinations 2013/2014

FIRST YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE, FOOD SCIENCE AND TECHNOLOGY AND FOOD SCIENCE AND NUTRITION

AHS 2101: AGRICULTURE AND AGROMETEOROLOGY

DATE: DECEMBER 2013

TIME: 2HOURS

INSTRUCTIONS: *Answer question one and any other two questions*

QUESTION ONE – (30 MARKS)

- a) Explain the following terms. (10 Marks)
- Agriculture as an art.
 - Field capacity
 - Permanent wilting point
 - Photoperiodism
 - Propeller anemometer
- b) Sustained agricultural growth is critical to growth of the national economy. Discuss the contribution of agriculture to Kenya's national income and development. (10 Marks)
- c) A soil sample at field capacity weighs 241 grams. The soil is then oven dried at 105°C for 24 hours and weighs 182 grams. Calculate the mass water content using the gravimetric method. (5 Marks)
- d) The Kenya meteorological department is the body mandated with the provision of meteorological information and services in Kenya. Highlight five (5) core functions of the department. (5 Marks)

QUESTION TWO (20 MARKS)

- a) Define the term agrometeorology and discuss two applications of agrometeorological information. (5 Marks)
- b) Describe features associated with the major agro-climatic zones in Kenya. (5 Marks)

c) You are presented with the following equation as an agrometeorological officer

$$\lambda ET = \frac{\nabla(R_n - G) + P_a C_p \left(\frac{e_s - e_a}{r_a} \right)}{\Delta + \gamma \left[1 + \frac{r_s}{r_a} \right]}$$

- i. State the name of the equation and the parameter it is utilized to calculate. (2 Marks)
- ii. Define each of the components making up the equation. (8 Marks)

QUESTION THREE (20 MARKS)

- a) Discuss three applications of agrometeorological information. (10 Marks)
- b) Differentiate between a pyranometer, albedometer and net pyranometer stating the specific parameters they are used to measure. (5 Marks)
- c) Rainfall is one of the water elements that determine crop performance. What are the rainfall characteristics that can result in either success or crop failure? (5 Marks)

QUESTION FOUR (20 MARKS)

- a) Wind erosion causes sand movement in three main stages. Discuss. (9 Marks)
- b) Discuss applications of agrometeorological information. (11 Marks)

QUESTION FIVE (20 MARKS)

- a) Briefly explain the challenges developing world is facing in tackling global warming. (5 Marks)
- b) Agricultural research system in Kenya comprise of various categories of institutions. Discuss these institutions whose role is carrying out agricultural research services. (10 Marks)
- c) Distinguish between soil water content and soil water potential. (5 Marks)