



KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER
SPECIAL/RESIT EXAMINATIONS

FOR THE DEGREE OF
B.SC (AGRICULTURAL BIOTECHNOLOGY AND EDUCATION)

COURSE CODE: SAB 313

COURSE TITLE: IRRIGATION AND DRAINAGE

DURATION: 2 HOURS

DATE: 03/02/2021 ~~2020~~

TIME: 11-1 PM.

INSTRUCTIONS TO CANDIDATES

Answer Question 1 (Compulsory) and any other TWO questions

This paper consists of 3 printed pages. Please Turn Over



KIBU observes ZERO tolerance to examination cheating

QUESTION ONE (COMPULSORY) – 30 MARKS

- a. State four reasons that may necessitate irrigation in any given area **(4marks)**
- b. State and explain five direct benefits of irrigated agriculture **(5marks)**
- c. Distinguish between moisture content at Field capacity and Permanent wilting point
- d. Describe the following moisture ranges **(6marks)**
 - i. Total available water
 - ii. Management allowed deficit
 - iii. Soil moisture deficit
- e. State and explain three methods of draining excess water from an irrigated agricultural land **(3marks)**
- f. State three positive and three negative environmental aspects of subsurface drainage. **(6marks)**
- g. State and explain **TWO** main factors affecting crop water requirement giving examples in each. **(6marks)**

QUESTION TWO – 20 MARKS

- a. With the aid of an illustration state and explain the main components of a drainage system **(10 marks)**
- b. State and explain the conditions, which favor sprinkler method of irrigation in any given area **(10marks)**

QUESTION THREE – 20 MARKS

- a. Define the term irrigation scheduling and state and explain two parameters in that are put into consideration during irrigation scheduling **(6marks)**
- b. A stream size of 160 lit /sec was released from the diversion headwork to irrigate a land of area 1.850 hectares. The stream size when measured at the delivery to the field channels is 130lit/sec. The stream continued for 8 hours. The effective root zone depth is 1.850m. The application losses in the field are estimated to be 445m³. The depth of water

penetration was 1.850m and 1.15m at the head and tail of the run respectively. The available water holding capacity of the soil is 22cm/m and irrigation was done at 62% depletion of Am. Find, Ef, Ea, Es and Ed. The stream size delivered to the plot was 110 lit/sec. (**14marks**)

QUESTION FOUR – 20 MARKS

- a. Define rain water harvesting and state and explain four types of farm ponds that are essential for rain water harvesting (**10marks**)
- b. Define pumping (**2marks**)
- c. State and explain four types of heads in an irrigation system (**8marks**)

QUESTION FIVE – 20 MARKS

- a. State and explain five factors that affect the duty of water in irrigation (**10marks**)
- b. State and explain five factors considered in determination of the most suitable surface irrigation method (**10marks**)