(Knowledge for Development)

KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR

FOURTH YEAR 2ND SEMESTER MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF SCIENCE AGRICULTURE AND BIOTECHNOLOGY

COURSE CODE: SAB 415

COURSE TITLE: SOIL WATER AND CONSERVATION

DATE: 4TH OCTOBER 2021 **TIME:** 9 – 11 AM

INSTRUCTIONS TO CANDIDATES

Answer Question ONE and any other TWO Questions.

TIME: 2 Hours

This paper consists of 3 printed pages. Please Turn Over

QUESTION ONE = 30 MARKS (Compulsory)

a) Briefly describe the two broad erosion control measures (6 Marks)

b) State the relationship between rainfall intensity and duration in expected rainfall run-off (4 Marks)

c) Briefly explain the benefits of soil and water conservation structures (4 Marks)

d) (4 Marks).

e) Explain the meaning of the terminologies below in relation to soil and water conservation for small holder farmers (6 Marks)

Peal Rate run-off

Available water holding capacity

Contour line

Deep percolation

Surface sealing

Water Table

f) Estimate the annual erosion for a field having a rainfall factor of 220, consisting mainly of loamy sand with 2% organic matter, and averaging a 4% slope with a slope length of 400 ft, which has been in continuous small grain, normally planted in June, with moderate residue worked under and farmed up and down the slope. Where : where R = 220; K = 0.10, L S = 0.73, CP = 0.29, (3 Marks)

g) Explain the two key main parts in the terracing earthworks. (3 Marks).

h) Highlight the main causes of Gully erosion (4 Marks).

QUESTION TWO = 20 MARKS

a) Highlight the two main types of erosion and their causes. (4 Marks).

b) State the Universal soil loss equation and explain the factors that influence water erosion (14 Marks).

QUESTION THREE = 20 MARKS

(a) Describe the key factors involved in erosion management in Kenya. (10 marks).

(b) With the aid of a flow chart highlight the erosion control measures. (10 marks).

QUESTION FOUR = 20 MARKS

4. a) Briefly highlight the key factors an engineer will consider in the design of soil and water conservation structures (12 Marks)

b) Highlight the key benefits of Soil Water and conservation structures over a period of five years after construction. (8 Marks).

QUESTION FIVE = 20 MARKS

5. a) Outline the key functions of a 'Fanya Juu' terrace in erosion management. (10 Marks).

b) State five limitation of terraces (5 Marks)

c) Briefly explain the statement' Human activity in Kenya is the key limitation to the sustainability of terracing efforts in the hilly areas. (5 Marks).