EGERTON UNIVERSITY

UNIVERSITY EXAMINATIONS

NJORO CAMPUS

SECOND SEMESTER 2011/2012

FOURTH YEAR EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGEN 352: SOIL AND WATER MANAGEMENT

STREAM: 2008 (Y4) AGED   **TIME:** 3 hours

DAY/TIME: Friday, 08.30 – 11.30 am   **DATE:** 27/04/2012

INSTRUCTIONS:

1. The paper consists contains **FIVE** questions.
2. Attempt any ~~ALL~~ four questions.
3. Marks for each question are shown in parenthesis.
4. Clearly show your working.
5. Scientific calculators may be used.
6. **EACH QUESTION SHOULD BE STARTED ON A NEW PAGE.**

QUESTION ONE

(a) Distinguish between the following terms as used in surveying:

   (i)   Accuracy and precision.   **(2 marks)**

   (ii)   Bench Mark and Datum.   **(2 marks)**

   (iii)   Foresight and backsight.   **(2 marks)**

   (iv)   Plane Survey and Geodetic survey.   **(2 marks)**

(b) A 60 m tape was found to be 2.5 cm too long after taping 2050 m. It was then found to be 25 cm long after taping 3050 m. If the tape was correct before commencement of the work, find the true distance measured. Take the general slope of the land to be 12%.

(8 marks)

(c) Describe the **TWO** main principles of survey. (4 marks)

QUESTION TWO

(a) A tape of 50 m weighs 0.036 kg/m with a standard tension of 85 N. If it is supported at both ends calculate the sag correction. What is the correct length of a distance observed to be 330.42m ? (10 marks)

(b) Discuss the process of runoff. (4 marks)

(c) Discuss briefly **SIX** cultural practices that reduce soil erosion. (6 marks)

QUESTION THREE

(a) (i) State the **TWO** assumption of Simpson's rule. (2 marks)

(ii) The following depths were recorded along a cross section of a river in meters: 3.82, 4.39, 6.87, 5.27, 7.58, 8.95, 9.57, 8.43, 6.43, 4.35 and 4.05. If the depths are measured at 12 m interval, calculate the cross sectional area using Simpson's rule.

(6 marks)

(b) Discuss the **SIX** applications of USLE in soil and water conservation. (9 marks)

(c) Describe the **THREE** steps in which wind erodes. (3 marks)

QUESTION FOUR

(a) Discuss **THREE** important factors in terrace design. (6 marks)

(b) Highlight **SIX** important factors that should be considered in farm planning. (9 marks)

(c) Describe **TWO** main types of erosion. (5 marks)

QUESTION FIVE

(a) Discuss **FOUR** application of Plane levelling survey in soil and water conservation.

(8 marks)

(b) The following consecutive staff readings were taken on pegs at 10 m interval on a continuously sloping ground.

0.995, 1.405, 2.900, 1.970, 2.890, 3.455, (2.320, 2.925) CP, 3.750, 3.995, 1.885, 2.450 (Station A)

Reduced Level (R.L.) of station A where the reading 2.450 was taken is known to be 52.250 and was taken as a Bench Mark. From the last position of the instrument two stations B and C with R.L. 52.800 and 53.000, respectively are to be established without disturbing the instrument. Work out the staff readings at stations B and C, complete all the work in level book form and carry out the necessary checks. Use Height of Instrument method.

(12 marks)

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