

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE

AGEN 352: SOIL CONSERVATION AND WATER MANAGEMENT

STREAMS: BSC AGED Y4S2

TIME: 2 HOURS

DAY/DATE: MONDAY 08/04/2024

8.30 A.M – 10.30 A.M.

INSTRUCTIONS:

- Answer ALL questions in SECTION A (30 marks) and any two in SECTION B (40 marks)

SECTION A

QUESTION ONE

- (a) Explain the three steps common to both water and wind erosion. (3 marks)
- (b) Mathematically express the concept of map scale. (4 marks)

QUESTION TWO

- (a) Discuss the potential impacts of desertification on human health. (4 marks)
- (b) Derive the RUSLE equation for computing the average annual erosion expected on field slopes. (4 marks)

QUESTION THREE

- (a) Describe ANY ONE (1) surveying instrument in use around the world. (2 marks)
- (b) Derive the Runoff equation for a linear reservoir. (5 marks)

QUESTION FOUR

- (a) Explain the indirect method of vertical distance measurement. (4 marks)

- (b) The length of a line measured with the help of a 25 cm chain was found to be 639.4m. It was found afterwards that the chain was 0.06m long. Find the true length of the chain. (4 marks)

SECTION B

QUESTION FIVE

- (a) Explain the key properties of water. (6 marks)
- (b) Explain the comparisons and differences between compass and plane table survey. (6 marks)
- (c) Differentiate between accuracy and precision as applied in survey. (8 marks)

QUESTION SIX

- (a) Explain the factors that determine the vulnerability of soils to water erosion. (8 marks)
- (b) Derive the cellular automation SCAVAT mathematical Model of Soil Erosion Process. (6 marks)
- (c) A basic tenet of surveying is that no measurement is perfect and that there will always be a small amount of error. Discuss the classes of survey errors. (6 marks)

QUESTION SEVEN

- (a) Convert the angle $312^{\circ}21'51''$ into decimal and radian systems. (6 marks)
- (b) Explain the meteorological factors affecting runoff. (8 marks)
- (c) A problem with defining land degradation is that what one group of people might view as degradation, others might view as a benefit or opportunity. Discuss giving relevant examples. (6 marks)
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