

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH & ENVIRONMENTAL SCIENCES
DISCIPLINE OF GEOGRAPHY
MAIN EXAMINATION: JUNE 2015
COURSE & CODE: SOIL EROSION AND LAND DEGRADATION-
ENVS315W

DURATION: 3 HOURS

TOTAL MARKS: 300

Internal Examiner: Ms S Munien, Dr S Pillay

External Examiner: Prof W Nel

NOTE: THIS PAPER CONSISTS OF 2 PAGES. PLEASE SEE THAT YOU HAVE THEM ALL.

Instructions: Answer both Section A and Section B

SECTION A: (ANSWER ALL QUESTIONS)

Question 1 Define the following concepts

1.1 Reynolds Number

1.2 Subsurface flow

1.3 Rainfall erosivity

1.4 Cation Exchange Capacity

1.5 Soil dispersivity

(6 x 5 = 30 marks)

Question 2

The processes of erosion, transportation and deposition sediments are influenced by physical and chemical properties of soil. Describe the above using Figure 1.

(40 marks)

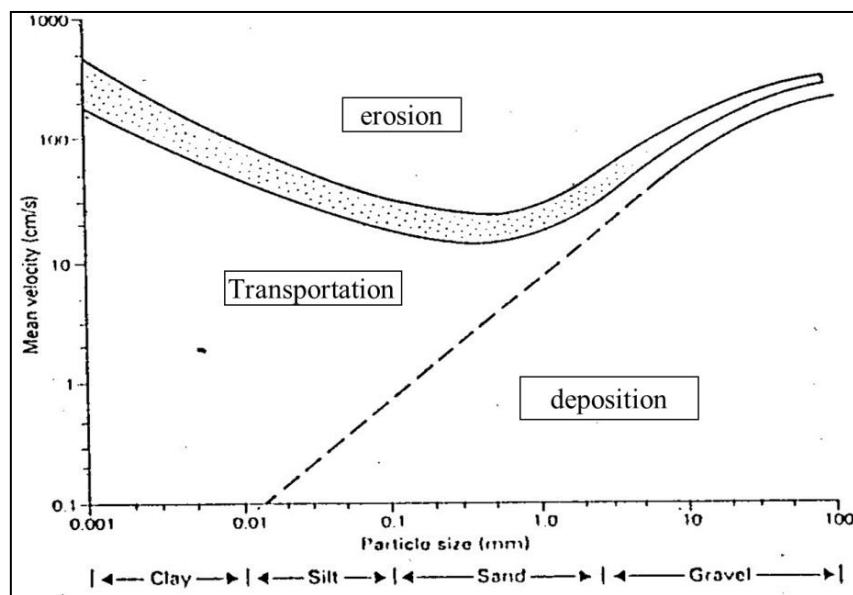


Figure 1: Hjulstrom diagram

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Question 3

Use illustrative examples to highlight the processes of sealing, crusting and compaction. Briefly describe the impacts associated with each of the above.

(30 marks)

Question 4

Using specific examples from the field trip to the Drakensberg, describe the influence of terrain and ecology on soil composition and profile development.

(50 marks)

SECTION B: (ANSWER TWO OF THE FOLLOWING QUESTIONS)

Question 5

Soil Survey and land use planning are essential inputs in proper land management. Describe two types of soil survey methods and the procedures involved in soil survey for decision making and land use planning.

(75 marks)

Question 6

Explain how the erosion hazard potential may be quantified and, describe the conservation and mitigation measures that can be applied to limit the erosion hazard or restore protection to soils.

(75 marks)

Question 7

Write an essay on the use of models in the study of soil erosion. Include in your essay the need for modelling, the types of models applicable to the study of soil erosion, their utility, advantages and drawbacks and, describe in detail one widely used, empirically based soil loss model.

(75 marks)