

**UNIVERSITY OF KWAZULU-NATAL  
PIETERMARITZBURG CAMPUS**

**EXAMINATIONS: June, 2014**  
**School of Agricultural, Earth and Environmental Sciences:**  
**ENV5315 SOIL EROSION AND LAND DEGRADATION**

**DURATION: 3 HOURS**

**TOTAL MARKS: 300 Marks**

**Internal Examiner: Prof. H.R. Beckedahl**  
**External Examiner: Prof. S. Grab**

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This paper consists of **TWO** pages. Please see that you have both. Answer a total of **THREE QUESTIONS: ONE** from **EACH SECTION** . Each question carries equal marks.

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**Section A: Answer ONE question**

**QUESTION 1:**

You have been retained as an advisor on matters pertaining to soil conservation to the Eastern Cape Division of the Department of Agriculture. The department is planning to start a new rehabilitation programme and is considering relatively cheap options. An official has noticed the two sites shown in Figures 1 and 2 and has requested your advice concerning the relative advantages and problems associated with the techniques shown. Present your response in writing, stating i) what conservation measure is being used, ii) its relative advantages, and iii) what alternative measures could be used that are comparable in price and efficiency. You are required to justify your answers. (100)



**QUESTION 2:**

You have been asked to comment on why many gabions in South Africa fail (as seen in Figure 3). Give a written explanation, outlining the requirement for correct installation as well as the common pitfalls associated with the use of gabion structures. (100)



Figure 3

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**Section B: Answer ONE question**

**QUESTION 3:**

Discuss the use of erosion control blankets (ECBs), explaining their use and how they need to be installed. Compare these with 'harder' interventions such as the range of Turf Reinforcing Mats (TRMs). (100)

**QUESTION 4:**

Briefly outline the interdependence between rainfall erosivity, soil erodibility, and slope characteristics in the initiation of soil erosion. (100)

**QUESTION 5:**

Although the processes associated with soil piping are well known, it is difficult to recognise in its early stages. In consequence, little is known about the **cost-effective** rehabilitation of areas affected by it. Discuss. (100)

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**Section C: Answer ONE question**

**QUESTION 6:**

Briefly review the principles of Sustainable Land Management (SLM), and relate this to issues of erosion and degradation. (100)

**QUESTION 7:**

Review the complexities of soil conservation issues from **both** a social **and** an environmental perspective, and highlight how global warming might affect the nature and extent of the problem. (100)

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