



"Investing in Africa's Future"

FACULTY OF AGRICULTURE AND NATURAL RESOURCES

ANE301: ENVIRONMENTAL AND ECOLOGICAL REHABILITATION

END OF FIRST SEMESTER EXAMINATIONS

NOVEMBER/DECEMBER 2016

LECTURER: PROFESSOR F. TAGWIRA

DURATION: (3HRS)

INSTRUCTIONS

1. Do Not Write Your Name On The Answer Sheets.
2. Use Answer Sheets Provided.
3. Begin Your Answer For Each Question On A New Page.
4. Credit Is Given For Neat Presentation Of Answers.



ANE301 ENVIRONMENTAL AND ECOLOGICAL REHABILITATION

ANSWER ANY 5 QUESTIONS IN THIS PAPER. EACH QUESTION IS WORTH 20 MARKS.

Question 1:

- a) Soil Erosion is known to be a function of 4 physical factors. List them. (4)
- b) Explain to the farmer in detail the information given in Table 1 below. (10)
- c) What are the advantages of no till –tied ridges? (6)

Table 1. Typical annual losses of soil, rainfall and nutrients from farmlands

Source	Soil (t/acre)	Rain (%)	Carbon (lbs/acre)	Cost of N and P (US\$/ha)
Small Scale Farming On Well Drained Soil				
Current rate	22	30	477	31
Tie Ridging	0.9	5	19	1
Commercial Farming On Heavier Soils				
Continuous (Cotton)	33	35	1030	82
Tie ridging (Cotton)	2	7	69	5
Continuous (maize)	15	20	206	20
Trash/mulch (maize)	0.4	5	13	1

Question 2:

- a) Explain the advantages and disadvantages of phytoremediation. (10)
- b) What is the difference between phytoextraction, phytodegradation, volatilization and stabilization? (4)
- c) What do you understand by nanoremediation and mycoremediation? (2)
- d) Explain some of the insitu and exsitu technologies used in remediation. (4)

Question 3:

Explain the important aspects of the guidelines for ecological rehabilitation/restoration. (20)

Question 4:

What are the important aspects of lake/dam restoration? Give some of the important techniques that are used. (20)

Question 5:

- a) Explain the benefits of mulch farming and minimum tillage in reducing land degradation. (10)
- b) Explain how you would rehabilitate the land below the AU ponds to ensure that the adjacent river is not polluted. (10)

Question 6:

- a) List separately the morphological and physiological attributes of the vetiver system. (14)
- b) Explain how you would deal with the problem of toxic leachate coming from a landfill. (3)
- c) Explain the benefit of using vetiver to deal with the problem of slurry from piggery units. (3)

Question 7:

- a) List the principles of mine rehabilitation. (10)
- b) What are the factors to consider in landform design. (5)
- c) Which soil physical and chemical factors affect mine rehabilitation generally? (5)

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