# UNIVERSITY OF SWAZILAND

## MAIN EXAMINATION PAPER: 2013/2014

**TITLE OF PAPER:** MICROBES AS A RESOURCE

**COURSE CODE:** ERM 613

**TIME ALLOWED:** THREE HOURS

**INSTRUCTIONS:**

1. ANSWER ANY THREE QUESTIONS
2. EACH QUESTION CARRIES TWENTY FIVE (25) MARKS

**SPECIAL REQUIREMENTS:** NONE

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED BY THE INVIGILATORS**

**Question 1**

a) Indicate the significance of microbes-metal interactions to the environment. (12.5 marks)

b) What is the role of microorganisms in the generation of renewable energy? (12.5 marks)

**[TOTAL MARKS = 25]**

**Question 2**

a) Compare and contrast the processes of nitrification and denitrification in terms of organisms involved, the environmental conditions that favour each process, and the changes in nutrient availability that accompany each process (12.5 marks)

b) Write short notes on the following:
   i) Microbial desulfurization of coal (6.5 marks)
   ii) Composting as a spontaneous process (6 marks)

**[TOTAL MARKS = 25]**

**Question 3**

Bioremediation is an ecologically sound and sustainable approach to environment pollution. Elaborate citing documented cases. (25 marks)

**[TOTAL MARKS = 25]**

**Question 4**

Microbiology and gene modifications have no place in environmental resource management. Support or refute this statement. (25 marks)

**[TOTAL MARKS = 25]**