INSTRUCTIONS: Answer ANY FOUR (4) QUESTIONS
All questions carry equal marks
Question 1

(a) Give the scope of Soil Microbiology and Biochemistry, clearly identifying the biotic and abiotic soil factors. [8 marks]

(b) Give the general overview of biological diversity in soils and group the organisms in relation to the nature of their cells. [9 marks]

(c) What is functional redundancy? How is it related to soil quality and biological diversity? [8 marks]

Question 2

Discuss the process of organic matter (OM) decomposition with respect to the responsible microorganisms, determining soil factors, the nature of decomposing OM, and the significance of the process to the soil. [25 marks]

Question 3

(a) Describe the criteria for classification of soil microorganisms. [15 marks]

(b) Outline the classification of soil fungi, using the criteria (or some of the criteria) you described in (i) above. [10 marks]

Question 4

(a) What are the two parameters normally measured in the study of soil microorganisms? [4 marks]

(b) Give three principles of the measurements of soil microorganisms [6 marks]

(c) Below are means in which the principles of measurements/assessment of soil microorganisms can be attained.
   A. Measuring soil abiotic factors
   B. Counting the number of organisms present in the soil
   C. Culturing organisms present in the soil
   D. Correlating morphology of organisms with their interaction with the environment
   E. Measuring metabolic pathways for different communities
   F. Assessing accumulation of metabolic products
G. Assessing metabolic products and their effects on the habitat

Describe the two procedures that you were introduced to in Soil Microbiology and Biochemistry course, clearly showing the objectives and what was actually obtained from each procedure. [15 marks]

Question 5

(a) Give other important soil microbial processes besides OM decomposition. [4 marks]

(b) In a tabular format, outline any one very important soil microbial process (and its subdivisions, where applicable) besides OM decomposition, clearly showing soil factors that influence that process and their effect to the process, the effect (impact) of the process to the soil, and specific microorganisms involved in the process. [11 marks]

(c) Describe any two biological (cell–cell) interactions where at least
   (i) One organism will benefit without the other being significantly affected. [4 marks]
   (ii) One organism will benefit while the other one is generally harmed. [4 marks]
   (iii) And one biological (cell–cell) interactions where both organisms benefit. [2 marks]

***The End***