



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

INSTITUTIONAL BASED PROGRAMME (IBP) AUGUST 2010 SESSION

EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE

KRM 501: SOIL BIOLOGY AND BIOCHEMISTRY

DATE: Tuesday 28th December 2010

TIME: 9.00a.m -12.00p.m

INSTRUCTIONS

Answer Question ONE and any other THREE.

1. (a) Name the bacteria which oxidize reduced sulfur compounds to sulfate in soil. Show by equation how that is achieved. **(6 marks)**
- (b) Before the soil at Yala swamp was reclaimed the pH was 6.5. After a year, its pH had dropped to 5.0. Explain the cause of the pH drop. **(4 marks)**
- (c) Explain the following terms:
 - (i) chemoautotrophs
 - (ii) photoautotrophs
 - (iii) nitrogen
 - (iv) recalcitrant molecule
 - (v) fermentation**(10 marks)**
- (d) Explain photosynthesis by phototrophic bacteria. How does it differ from photosynthesis by higher plants?
- (e) What is the role of bacteroids in N fixation? **(5 marks)**
- (f) Explain how microorganisms obtain energy for their metabolic activities in soil. **(2 marks)**

2. Protein is an important organic substrate. Discuss its biodegradation and the main end product at each step of degradation. **(15 marks)**
3. Distinguish between biodegradation of DDT and chitin in soil. Discuss the advantages of biodegradation to environment and man. **(10 marks)**
4. With examples name two types of hydrocarbon and explain why they are not easily biodegraded in soil. **(15 marks)**

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