KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2010/2011

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (AGRICULTURE/CROP IMPROVEMENT AND PROTECTION)

KST 204: AGRICULTURAL MICROBIOLOGY

DATE: WEDNESDAY, 30TH MARCH 2011 **TIME: 11.00 A.M. - 1.00 P.M.**

INSTRUCTIONS: Answer ALL Questions in Section A and TWO Questions in Section B

SECTION A: ANSWER ALL QUESTIONS (40 MARKS)

1. Differentiate between: (5 marks)
   (i) Coenocytic and septate fungi
   (ii) Lytic and lysogenic bacteriophages
   (iii) Plasmid and nucleoid
   (iv) Zoospore and chlamydospore
   (v) Capsomeres and capsule
2. Explain the relationship between resolving power and the wavelength of radiation and how this relationship has been utilized in the development of microscopy (5 marks)
3. Write brief notes on cell fractionation (5 marks).
4. Describe how the following are used in microbiology (5 marks)
   (i) Centrifuge
   (ii) Shaker
   (iii) Haemocytometer
   (iv) Spectrophotometer
   (v) Nitrocellulose membranes

5. Microbial cells have been described as 'open systems'. Discuss this statement, in the context of the Surface Area to Volume ratio (5 marks).
6. Lysosomes have important functions but can be potentially lethal to a cell. Discuss (5 marks).
7. Use an illustration to explain why Gram negative bacterial pathogens are more difficult to control (5 marks).
8. Describe the functional and compositional differences of cell walls in plants, bacteria and fungi (5 marks).

SECTION B: ANSWER ANY TWO QUESTIONS (30 MARKS)

9. Elaborate the mechanisms that facilitate DNA exchange in bacteria, resulting in genetic diversity. (15 marks).
10. Using an enterprise of your choice, write an essay describing how knowledge of microbiology can be applied profitably in agriculture. (15 marks).
11. Microorganisms are important in sustaining ecosystems that support life on earth. Discuss. (15 marks)
12. Discuss prokaryotes on the basis of nutritional and metabolic diversity, considering
    (i) Energy sources and carbon metabolism (9 marks)
    (ii) Oxygen and cellular respiration (6 marks)