CHUKA UNIVERSITY

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN BIOMEDICAL

BMED 222: MICROBIAL PHYSIOLOGY AND GENETICS

STREAMS: BSC (BMED) **TIME: 2 HOURS**

DAY/DATE: TUESDAY 02/08/2016 **2.30 PM – 4.30 PM**

INSTRUCTIONS:

Answer Question One and other Two Questions

Question One (30 marks)

(a) Briefly explain the meaning of the term microbiology. [1 mark]

(b) Define generation time and explain how it is calculated. [5 marks]

(c) Calculate the generation time of a bacterial population that increases from 10,000 cells to 10,000,000 cells in four hours of growth. [3 marks]

(d) Briefly explain bacterial enumeration and state its significance. [4 marks]

(e) Differentiate between Embden-meyerhof and Entner-doudorof pathways. [3 marks]

(f) Differentiate between endotoxin and exotoxin. [2 marks]

(g) Explain the biotechnological use of fermentation in yeast. [3 marks]

(h) Explain some mechanisms by which pathogenic bacterial causes diseases. [4 marks]

(i) Differentiate between aerobic and anaerobic respiration in bacterial. [5 marks]

Question Two (20 marks)

(a) Outline the main phases of a typical growth curve of a bacterium in a batch culture. [4 marks]

(b) Discuss what would happen if bacteria from the exponential phase are transferred into a fresh medium of similar constitution and into another one with very different constitution. Use appropriate diagrams to illustrate your answer. [6 marks]

(c) Explain the classification of chemically defined synthetic media. Give appropriate examples. [8 marks]

(d) Distinguish between prokaryotes and eukaryotes. [2 marks]

Question Three (20 marks)

(a) Briefly describe three fermentation pathway and state the application of their end products. [10 marks]

(i) Define plasmid and state its functions. [6 marks]

(ii) State two enzymes used in gene cloning and outline their roles. [4 marks]

Question Four (20 marks)

(a) Describe the mechanism through which bacteria reproduce. [10 marks]

(b) Explain five ways of classifying bacteria. [10 marks]
