CRAWFORD UNIVERSITY
FAITH CITY, IGBESA, OGUN STATE

2016/2017 RAIN SEMESTER EXAMINATIONS
COLLEGE: NATURAL AND APPLIED SCIENCES
DEPARTMENT: BIOLOGICAL SCIENCES
PROGRAMME: MICROBIOLOGY COURSE CODE: MCB 414
COURSE TITLE: INDUSTRIAL MICROBIOLOGY. COURSE UNIT: 3 TIME: 3 HRS
INSTRUCTION: QUESTION 1 IS COMPULSORY AND ANY OTHER 4 QUESTIONS

1a. With a well annotated diagram describe a fermentation system (10 Marks)
b. Using the various components in a bioreactor; List and write short notes on the various physical factors determining proper environment in a bioreactor (5 Marks).
c. List the characteristics and sources of industrial microorganisms? (5 Marks)

2a. What is the difference between a free enzyme and an immobilized enzyme? (4 Marks)
b. Discuss the role of immobilized enzyme in the formation of industrial fermentation end-products? (6 marks)

3a. Name and write short notes on the two metabolites produced by microbes in industrial fermentation (5 Marks).
b. How may the strains of industrial microorganisms be improved? (5 Marks)

4a. Discuss extensively five media used in industrial fermentation. (5 Marks)
b. List 10 major products of industrial fermentation.(5marks)

5a. Write a comprehensive note on Foaming as a concept in industrial fermentation. (7 Marks)
b. How can foaming be prevented in industrial fermentation? (3Marks)

6a. Why is a bioreactor better than a large flask for industrial production of an antibiotic? (4 Marks)
b. Write short notes on the production of:
i. Vitamins (2Marks)
ii. Amino acids (2 Marks)
iii. Antibiotics (2 Marks)

7a. What is industrial microbiology? Why is it important? (5 Marks)
b. Suppose you are culturing a microorganism that produces enough lactic acid to kill itself in a few days: how can the use of a bioreactor help you maintain the culture for weeks or months? (5 marks)