



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2011/2012

**SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELLOR OF
SCIENCE DEGREE IN MOLECULAR CELL BIOLOGY**

SBC 426: ENVIRONMENTAL BIOTECHNOLOGY

DATE: Monday 2nd April, 2012

TIME: 4.30 p.m. – 6.30 p.m.

Section A: Answer ALL questions (20 marks)

1. Strains of *Bacillus thuringiensis* are also classified into five pathoytpes on the basis of their insecticidal range (5 marks); namely:

- (i) _____;
- (ii) _____;
- (iii) _____;
- (iv) _____.

2. Immobilized enzymes are classified into four broad groups by IUPAC, based on (5 marks) namely:

- (i) _____,
- (ii) _____,
- (iii) _____,
- (iv) _____.

3. Fill in the empty gaps

(5 marks)

Naturally occurring transmissible catabolic plasmids			
Primary substrate	Plasmid	Size	Bacterial host strain
(i)			
(ii)			
(iii)			
(iv)			
(v)			

4. (a) State the principle of microbial electrodes.

(1 mark)

(b) Name four biosensors used in the assay of biological products *in situ*.

(4 marks)

Section B: Answer ALL Questions (5 marks each)

5. Give five examples of reactions occurring in an anaerobic digestion tank in a waste water treatment plant.

6. Explain the term xenobiotics and describe they enter the environment.

7. Giving two examples for each, explain the meaning of the terms “commensalism” and “mutualism”.

8. State the advantages of using *Bacillus thuringiensis* pesticides compared to using chemical pesticides.

9. Give five applications of biosensors.

10. Describe the use of microbial rennets as a digestive aid.

Section C: Answer any TWO Questions (10 marks each)

11. Describe the role of *Alcanivorax borkumensis* in the *in situ* remediation of oil spills.

12. Discuss the microorganisms used in mineral ore leaching.

13. Discuss immobilization by micro-encapsulation.