



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF
SCIENCE (BIOTECHNOLOGY)

SBC 535: PLANT CELL AND TISSUE CULTURE

DATE: TUESDAY, 3RD APRIL 2012

TIME: 9.00 A.M. – 12.00 P.M.

INSTRUCTIONS: Answer ALL questions in Section A [5 marks each] and 3 questions in section B [20 marks each]

Section A

1. Define the following terms as applied to plant cell and tissue culture:

- A. Multipotent
- B. Pluripotent
- C. Totipotent

2. List the advantages of cryopreservation over other methods of germplasm conservation.

3. Briefly explain the “central dogma” of plant tissue culture

4. Describe the techniques used for immobilization of plant cells in culture

5. What is “nurse culture”? How is it achieved?

6. Give two examples each, of commercial fungal cellulases, pectinases and hemicellulases used to isolate plant protoplasts.

7. Illustrate the phenomenon of epigenetics in plant tissue culture.

8. Distinguish between cybrids and hybrids generated through cell culture

Section B: Answer 3 questions [20 marks each]

1. Outline how plant cell cultures are used as alternative production systems for known and novel secondary metabolites.
2. Using examples, discuss the impact of plant cell and tissue culture technologies on agriculture/horticulture/floriculture in Kenya.
3. Narrate the methods employed in protoplast fusion and the applications of this tool in crop improvement.
4. Discuss the current status of understanding pertaining to in vitro cell and tissue culture induced variation in plants.
