



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY**

**ABT 4302: CELL, TISSUE AND ORGAN CULTURE PAPER I**

**END OF SEMESTER EXAMINATION**

**SERIES: DECEMBER 2016**

**TIME: 2 HOURS**

**DATE: Dec 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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## **Question ONE**

- a) Explain the various sterilization techniques used in a tissue culture laboratory (6 marks)
- b) Describe the continuous type of suspension culture (5 marks)
- c) Give a detailed protocol for shoot tip culture (4 marks)
- d) Explain the three most successful protoplast fusion strategies (6 marks)
- e) List the SIX problems associated with somatic embryogenesis (3 marks)
- f) What are the events that give rise to somaclonal variation at the molecular level? (4 marks)
- g) Differentiate between symmetric and asymmetric hybrids (2 Marks)

## **Question TWO**

- a) Outline EIGHT basic properties of a cell that makes it easy to manipulate in a plant tissue culture (16 marks)
- b) Differentiate between shoot buds and somatic embryos (4 marks)

## **Question THREE**

- a) Describe the various applications of Somatic Embryogenesis (12 marks)
- b) Outline the protocol involved in the establishment of nodal segment cultures for clonal propagation (8marks)

## **Question FOUR**

- a) Describe the processes involved in the Isolation of Somaclonal Variants (16 marks)
- b) Highlight FOUR opportunities that are associated with Cybrid production (4 marks)

## **Question FIVE**

Give a detailed account of the requirements for establishing *in vitro* plant cultures (20 marks)