



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

UNIVERSITY EXAMINATIONS

2021 / 2022 ACADEMIC YEAR

**MAIN EXAMINATIONS
MAIN CAMPUS**

FIRST YEAR SECOND SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF
MASTER OF SCIENCE IN MOLECULAR BIOLOGY**

COURSE CODE: SBB 823

**COURSE TITLE: PLANT CELL, TISSUE AND ORGAN
CULTURE**

DATE: FRIDAY, 22ND APRIL 2022

TIME: 9:00 – 12:00 P.M.

INSTRUCTIONS TO CANDIDATES

Answer ANY FOUR questions (60 marks)

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. 

1. Several nutrient media recipes for the cultivation of carrot callus are available in the literature. Imagine you got a new carrot variety which does not grow in the established media. Discuss parameters that you would change or options that you would try to make a callus of that new carrot variety growing well in your tissue culture laboratory.
(15 marks)
2. Describe somatic embryogenesis and discuss challenges that may appear during cultivation in a tissue culture laboratory.
(15 marks)
3. Imagine you prepared culture tubes, inoculation needles, scalpels, Erlenmyer flasks and glass petridishes and a culture medium that needs to be enriched with the antibiotic tetracycline. Unfortunately your autoclave does not function. Discuss alternative ways of how you would sterilise these tools and medium to be able to work under aseptic conditions. (15 marks)
4. By using an example, discuss pros and cons of client oriented plant breeding.
(15 marks)
5. Your supervisor gives you the task to transform *Agrobacterium tumefaciens* with a Ti plasmid. In your laboratory you have available the antibiotic ampiciline, the sugar X-Gal and an electroporator. Design a cloning and transformation protocol which includes the use of these three components.
(15 marks)
6. Very often somaclonal variation is considered a disadvantage / disturbance in tissue culture procedures. Discuss experiments / cases and give research hypothesis in which somaclonal variation can be used positively.
(15 marks)