



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

MAIN CAMPUS/WEBUYE CAMPUS
MAIN EXAMINATIONS

UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR

SECOND YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE
OF
BACHELOR OF SCIENCE IN BIOLOGY/ BIOTECHNOLOGY/
EDUCATION SCIENCE

COURSE CODE: SBL 221

COURSE TITLE: BIOLOGICAL TECHNIQUES

DATE: THURSDAY 23RD MAY 2019

TIME: 4-6 PM

INSTRUCTIONS TO CANDIDATES

Answer all questions in section A and any TWO selected from section B

TIME: 2 HOURS

MMUST observes ZERO tolerance to examination cheating
This paper consists of 4 printed pages. Please turn over

SECTION A (SHORT ANSWER QUESTIONS,40 MARKS)

1. Define the following terms as used in biological techniques
 - i. Decalcification (2.5 marks)
 - ii. Tissue processing (2.5 marks)
2. State and explain FIVE (5) different types of microscopes (5 marks)
3. State FIVE (5) objectives of plant specimen collection and preservation (5 marks)
4. What is the difference between progressive and retrogressive (regressive) staining (4 marks)
5. Discuss the process of clearing or dealcoholisation (4 marks)
6. Outline SIX (6) materials required in plant specimen collection (6 marks)
7. Once the tissue has been fixed, it must be processed into a form in which it can be made into thin microscopic sections. Describe the three steps involved (6 marks)
8. State FIVE (5) technical applications of polymerase chain reaction (4 marks)

SECTION B (ESSAY QUESTIONS, 30 MARKS)

9. Describe with the help of a diagram at least FIVE (5) types of microtomes (15 marks)
10. Common fixatives are grouped in to two categories. Simple fixatives and compound fixatives
 - i. State and explain FIVE (5) functions of simple fixatives (5 marks)
 - ii. State and explain FIVE (5) functions of compound fixatives (5 marks)
 - iii. Describe FIVE (5) factors that affects fixation of biological specimens (5 marks)
11. Describe how gram staining technique is used to differentiate between two major groups of bacterial cells (15 marks)