MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
THIRD YEAR SEMESTER ONE

SCHOOL OF TOURISM & NATURAL RESOURCE MANAGEMENT
BACHELOR OF FOREST ECOSYSTEM MANAGEMENT

COURSE CODE: FEM 3119
COURSE TITLE: TREE IMPROVEMENT AND BIOTECHNOLOGY

DATE: 13TH DECEMBER, 2018 **TIME: 0830 - 1030 HRS**

INSTRUCTIONS TO CANDIDATES

Answer **All** the Questions in Section A and any **THREE** IN SECTION B

*This paper consists of **TWO** printed pages. Please turn over.*

SECTION A. (25 marks): Answer ALL questions

1. Define the term biotechnology and briefly explain what modern biotechnology entails **(5 mark)**
2. Explain the following terms as used in tree improvement:
   i. Progeny **(1 mark)**
   ii. Environment **(1 mark)**
   iii. Family **(1 mark)**
   iv. Siblings **(1 mark)**
   v. Race **(1 mark)**
3. Differentiate between tree breeding and forest tree improvement? **(4 marks).**
4. Briefly highlight the host characteristics which contribute to disease resistance in forest trees **(5 marks)**
5. Explain the reasons why development of cloning techniques in forestry is important and give three tree species which have successfully been cloned in Kenya **(6 marks)**

SECTION B (45 marks): Answer ANY THREE questions

6. a) Discuss the major stages necessary for implementation of tree improvement program **(10 marks)**
   b) Identify the silvicultural traits that can be improved through biotechnology **(5 marks)**
7. a) Tree improvement as a discipline is vested with advantages and limitations. Discuss **(10 marks)**
   b) Highlight the ways in which genetic resources can be lost in forests **(5 marks)**
8. Discuss the potential of biotechnology in forestry and its applications in Kenya forests **(15 marks)**
9. Briefly describe seed orchards according to **the type of materials used**, **objective of seed production** and the **main function** in tree breeding/improvement program **(15 marks)**

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