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(*University of Choice*)

MASINDEMULIROUNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS
MAIN EXAMINATION

UNIVERSITY EXAMINATIONS 2021/2022 ACADEMIC YEAR

THIRD YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOTECHNOLOGY

COURSE CODE: SBT 322

COURSE TITLE: GENETIC ENGINEERING

DATE: WEDNESDAY, 20TH APRIL 2022 TIME: 8:00 – 10:00 A.M.

INSTRUCTIONS TO CANDIDATES

Answer ALL questions in section A and ANY TWO questions in section B

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

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

SECTION A (SHORT ANSWER QUESTIONS 40 MARKS)

1. Illustrate the process of cybridization and state its presumed advantages. (5 marks)
2. State the need for gene stacking and describe the gene stacking process. (6 marks)
3. Using illustration. Explain the process of RNAi interference. (5 marks)
4. Briefly describe the common gene stacking methods used in the production of biotech stacks. (6 marks)
5. Describe the antisense technology and state why it is important. (5 marks)
6. Using illustrations, describe the following vector;
    a. Ti (4 marks)
    b. Ri (3 marks)
7. State the purpose of gene pyramiding and describe the factors affecting the process? (6 marks)

SECTION B (ESSAY QUESTIONS, 30 MARKS)

8. Discuss;
    i. The process of gene editing using CRISPR Cas 9 (7 marks)
    ii. Advantages of CRIPR- Cas9 over ZFN (4 marks)
    iii. Its application in industry (4 marks)
9. Describe how;
    a. T DNA is transferred from bacteria into the nucleus of plant. (7 marks)
    b. Ti plasmid and bacterial chromosome work in concert to transform plant. (8 marks)
10. Describe briefly how you can;
    a. Use GFP as a biological tracer. (3 marks)
    b. Use a Gene Gun for transformation. (4 marks)
    c. Use Calcium phosphate to make competent cells. (5 marks)
    d. Use electroporation to make transient pores. (3 marks)