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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

SECTION A (SHORT ANSWER QUESTIONS, 40 MARKS)

1. Using an illustration, explain the importance of CRISPR-Cas as a bacterial defense system. (5 marks)

2. Describe the use of Green Fluorescing Protein in genetic engineering. (5 marks)

3. Using an illustration, explain the process of RNAi interference and possible agriculture solution from its use. (5 marks)

4. Briefly describe two direct gene transfer methods. (5 marks)

5. Using an illustration, describe the anti-sense technology and state why it is important. (8 marks)

6. Using illustrations, describe the following vectors;

    a. Ti and the role of opine in GE (4 marks)

    b. Ri (3 marks)

7. State the purpose of gene pyramiding and describe the factors affecting the process. (5 marks)

SECTION B (ESSAY QUESTIONS, 30 MARKS)

8. Describe;

    a) The process development of CRISPR Cas 9 as a gene editing tool. (6 marks)

    b) Advantages of CRIPR- Cas9 over TALENs. (4 marks)

    c) The application of CRISPR Cas 9 in an area of interest with detail on a specific gene. (5 marks)

9. Describe how;

    a) T DNA is transferred from bacteria into the nucleus of a plant. (7 marks)

    b) Ti plasmid and bacterial chromosome work in concert to transform plants. (8 marks)

10.

    a) Describe the process of protoplast isolation, cybridization and state its presumed advantages. (8 marks)

    b) State the need for gene stacking and describe the gene stacking process. (7 marks)

SBT 322: GENETIC ENGINEERING