



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2020/2021 ACADEMIC YEAR FOURTH YEAR SECOND SEMESTER

SCHOOL OF NATURAL RESOURCES, TOURISM AND HOSPITALITY BACHELOR OF ENVIRONMENTAL SCIENCE

**COURSE CODE: EBH 4239
COURSE TITLE: BIOTECHNOLOGY**

DATE: 13TH OCTOBER, 2021

TIME: 0830 – 1030 HRS

INSTRUCTIONS TO CANDIDATES

- Answer **ALL** questions in **Section A** and **any TWO** in **Section B**.
- Illustrate your answer with suitable diagrams and give examples wherever necessary.

This paper consists of 3 printed pages. Please turn over.

SECTION A : ANSWER ALL QUESTIONS (30MARKS)

1. Define the following terms as used in Biotechnology:
 - a) Promoter (1mk)
 - b) Hybridoma cell (1mk)
 - c) Vector (1mk)
2. Illustrate the formation of recombinant DNA (3mks)
3. Outline **three (3)** gene delivery techniques (3mks)
4. a) Highlight **two (2)** examples of restriction enzymes and specify whether they produce sticky ends or blunt ends of the DNA molecule (2mks)
b) Distinguish between sticky ends and blunt ends of DNA molecules during restriction enzyme digestion. (1mk)
5. List **three(3)** application of monoclonal antibodies. (3mks)
6. Differentiate between genomic DNA library and cDNA library. (3mks)
7. Describe interaction between Rhizobium bacterium and plant legumes. (3mks)
8. Explain bioremediation and give **one (1)** example of a genetically engineered organism that Can help in bioremediation. (3mks)
9. Describe gene therapy. (3mks)
10. Explain **three (3)** risks associated with the release of genetically modified organisms (GMOs) into the environment. (3mks)

SECTION B: ANSWER ANY TWO (2)QUESTIONS (40 MARKS)

11. Giving examples, discuss applications of Biotechnology. (20mks)
12. Genetic engineering is accomplished in a number of steps.
Discuss the steps. (20mks)
13. Give a detailed account of production of monoclonal antibodies using hybridoma technology. (20mks)
14. Discuss the nitrogen cycle. (20mks)

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