



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

**UNIVERSITY EXAMINATIONS**

**2022/2023 ACADEMIC YEAR**

**MAIN EXAMINATIONS  
MAIN CAMPUS/KAKUMA**

**THIRD YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE DEGREE  
OF**

**BACHELOR OF SCIENCE IN HUMAN NUTRITION AND DIETETICS**

**COURSE CODE: HND 314**

**COURSE TITLE: FOOD BIOTECHNOLOGY**

**DATE: 18/04/2023**

**TIME: 8.00-10.00 A.M**

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**INSTRUCTIONS TO CANDIDATES**

SECTION A: ANSWER **ALL** QUESTIONS [10 MARKS]  
SECTION B: ANSWER **ALL** QUESTIONS [30 MARKS]  
SECTION C: ANSWER **ANY TWO** QUESTIONS [30 MARKS]

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 3 Printed Pages. Please Turn Over.  
**HND 314: FOOD BIOTECHNOLOGY [MAIN]**

**SECTION A: MULTIPLE CHOICE QUESTIONS [10 MARKS]**

**(ANSWER ALL QUESTIONS IN THIS SECTION)**

1. Technique of inserting DNA (Deoxyribonucleic Acid) into animal cells is known as:
  - A. Micro injection
  - B. Macro injection
  - C. Fusion injection
  - D. Genome injection
2. What are the **CURRENT** benefits of having foods made from genetically modified crops?
  - A. They improve farm profitability and make some farmers' jobs easier.
  - B. They allow farmers to greatly increase the amount of crops produced.
  - C. They improve convenience for consumers, e.g. by creating foods with longer shelf lives.
  - D. They improve the nutritional quality of foods.
3. Which **ONE** of the following is used in industrial fermentation to produce food and drinks:
  - A. Yeast
  - B. Algae
  - C. Vitamins
  - D. Vaccines
4. Traditional breeding methods are:
  - A. selective breeding
  - B. cell fusion
  - C. mutation breeding
  - D. all of above
5. Field of biotechnology which is applied to industrial processes is known as-----
  - A. blue biotechnology
  - B. green biotechnology
  - C. white biotechnology
  - D. red biotechnology
6. Which of the following is **NOT** the property of the fermented food?
  - A. Highly Nutritious
  - B. Toxic
  - C. Anti-toxicity
  - D. Anti-nutrient
7. Sauerkraut is \_\_\_\_\_
  - A. A cauliflower
  - B. Potato
  - C. A cabbage
  - D. A tomato
8. Probiotics are used in the prevention of:
  - A. Cardiac disease

- B. Hypertension
  - C. Digestive tract disease
  - D. Lungs infections
9. Which is considered the first transgenic crop?
- A. Cotton
  - B. Maize
  - C. Tobacco
  - D. None of the above
10. The immobilized enzyme produced by micro encapsulation technique provides
- A. an extremely large surface area
  - B. smaller surface area
  - C. high amount of solvent
  - D. relatively smaller surface area

**SECTION B: SHORT ANSWER QUESTIONS [30 MARKS]**

**(ANSWER ALL QUESTIONS IN THIS SECTION)**

11. State **SIX** advantages of genetically modified foods [6 Marks]
12. Briefly describe at least **FOUR** main factors necessary for bacterial growth [6 Marks]
13. Outline **SIX** health benefits of fermented foods [6 Marks]
14. Explain the applications of biotechnology in nutrition [6 marks]
15. Write short notes on the following:
- i) Transgenic crops/animals [3 Marks]
  - ii) Genetically modified organisms(GMO) [3 Marks]

**SECTION C: LONG ANSWER QUESTIONS [30 MARKS]**

**(ANSWER ANY TWO QUESTIONS FROM THIS SECTION)**

16. Describe the ethical and regulatory issues of biotechnology in the food industry [15 Marks]
17. Discuss biotechnology as a process in the fermentation technology [15 Marks]
18. Biotechnology can be a savior for food security in the developing countries. Discuss [15 Marks]

