



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**BTMB**

**ABT 4406: RECENT ADVANCES IN INDUSTRIAL BIOTECHNOLOGY**

**END OF SEMESTER EXAMINATION**

**PAPER 2**

**SERIES: APRIL 2016**

**TIME: 2 HOURS**

**DATE: Pick Date May 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

**Do not write on the question paper.**

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## **Question ONE**

- a. Define the following terms.
- |                       |        |
|-----------------------|--------|
| i. Biofuel            | 1 mark |
| ii. Affinity sensor   | 1 mark |
| iii. Catalytic sensor | 1 mark |
| iv. Metabolic sensor  | 1 mark |
- b. State the Locard's Exchange Principle. 2 marks
- c. Describe the nature's antisense system in *E. coli*. 4 marks
- d. Outline the economic importance of algae as a source of biofuel. 6 marks

- e. Describe the use of nanomaterials in sports. 6 marks
- f. Explain the rationale behind the use of gene therapy to treat patients suffering from *beta*-Thalassemia. 8 marks

### **Question TWO**

Describe the stages of CRISPR-Cas defense. 20 marks

### **Question THREE**

- a) Using illustrations, describe antisense technology. 10 marks
- b) Explain the potential of nanomaterials in nanoremediation and water treatment. 10 marks

### **Question FOUR**

Discuss gene augmentation and inhibition therapies. 20 marks

### **Question FIVE**

- a. Explain air and water concerns with Biofuels. 7 marks
- b. Describe the use of antibodies or immunosensors in immunoassays. 7 marks
- c. Giving examples, describe the transient evidence in crime scene. 6 marks