



SOUTH EASTERN KENYA UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

BCH 303: BIOTECHNOLOGY II

DATE: 18TH APRIL, 2017

TIME: 4.00-6.00 P.M

INSTRUCTIONS TO CANDIDATES

- (a) Answer ALL the Questions in Section A**
 - (b) Answer ANY TWO Questions in Section B**
 - (c) Illustrate your answers with well labeled diagrams where appropriate**
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SECTION A (30 marks)

1. Explain the following terms:
 - a) Biosensor. **(2 marks)**
 - b) Bioremediation. **(2 marks)**
 - c) DNA vaccine. **(2 marks)**
 - d) Agricultural biotechnology. **(2 marks)**
 2. List any **four** challenges associated with the production of new generation vaccines against HIV-1. **(4 marks)**
 3. Describe the application of Polymerase Chain Reaction in the food industry. **(4 marks)**
 4. Briefly discuss why the claim that transgenic crops have no societal benefits is false. **(5 marks)**
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5. Describe the unique features of genetically modified *Pseudomonas putida*. **(4 marks)**
6. James, a staff and a research student working at Biochemistry Laboratory of South Eastern Kenya University has come up with a new invention and he would like to patent it. Describe the patenting procedures he would follow. **(5marks)**

SECTION B (40 marks)

7. Discuss **five** reasons for the successes and failures for application of biotechnology in the food industry. **(20 marks)**
8. Discuss the various applications of genetic engineering in agricultural biotechnology. **(20 marks)**
9. a) Explain **five** advantages of DNA- based immunization over the traditional forms of immunization. **(5 marks)**
- b) Describe the mechanism of action of DNA vaccines. **(15marks)**
10. a) Explain why *Zymomonas mobilis* is highly preferred over *Escherichia coli* in commercial production of biofuels. **(5 marks)**
- b) Explain the following types of intellectual properties:
- i. Patent. **(5 marks)**
 - ii. Plant breeder's rights. **(5 marks)**
 - iii. Trademarks. **(5 marks)**