



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

**A. M. E. C. E. A**

**MAIN EXAMINATION**

**JANUARY – APRIL 2015 TRIMESTER**

**FACULTY OF SCIENCE**

**DEPARTMENT OF NATURAL SCIENCES (BIOLOGY)**

**REGULAR PROGRAMME**

**BIO 212: ESSENTIALS OF BIOTECHNOLOGY**

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<b>Date: April 2015</b>	<b>Duration: 2 Hours</b>
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<b>Instructions: Answer Question ONE and any other TWO Questions.</b>
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- Q1. a) Define the following **(1 mark each)**
- i) Chimera
  - ii) Embryo transfer
  - iii) Multiple ovulation
  - iv) Clone
  - v) Bioethics
  - vi) Micropropagation
- b) Distinguish between the following **(2 marks each)**
- i) Gender reversal and gender pre-selection
  - ii) Southern blotting and northern blotting
  - iii) Nonotechnology and biotechnology
  - iv) Red and white biotechnology
  - v) Organismic and molecular biotechnology
  - vi) Bioremediation and biodegradation
- c) Using diagrams explain the following
- i) Functioning of antisense RNA **(3 marks)**
  - ii) Silencing of genes by si RNA **(4 marks)**
- d) i) What advantages do stem cells have over any other type of cell for scientific research? **(1 mark)**
- ii) What is biomimetics and what qualities of interest in living organisms guide its application in innovation? **(4 marks)**
- Q2. a) Discuss the tissue culture and protoplasts methods for angiosperm plants. **(12 marks)**

- b) How would a forensic scientist determine the guilty suspect using a DNA sample from a crime scene?  
**(8 marks)**
- Q3. What is gene therapy? Discuss its methods, potential problems and socio-ethical issues.  
**(20 marks)**
- Q4. a) What are the general questions that drive public controversy on plant transgenics?  
**(5 marks)**
- b) Explain in clear terms the advantages and disadvantages different plant tissue culture techniques may have over traditional horticultural methods of propagation using seed or cuttings.  
**(15 marks)**
- Q5. With illustrations discuss the pros and cons of genetically modified organisms.  
**(20 marks)**

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