



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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Date: April 2015	Duration: 2 Hours
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Instructions: Answer Question ONE and any other TWO Questions.

- 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)

END