UNIVERSITY OF EMBU

2016/2017 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

FOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE

ACS 410: BIOTECHNOLOGY

DATE: APRIL 13, 2017 **TIME: 8:30-10:30AM**

INSTRUCTIONS:

Answer Question ONE and ANY other TWO Questions

QUESTION ONE

a) Define the following terms

i. Genetically modified living organism (1 Mark)

ii. Recombinant DNA technology (1 Mark)

iii. DNA sequencing (1 Mark)

iv. Antisense strand (1 Mark)

v. Purines (1 Mark)

b) Differentiate between

i. Conventional biotechnology and DNA supercoiling (2 Marks)

ii. Induced mutation and Histones (2 Marks)

iii. Allele and Hereditary (2 Marks)

c) Write short notes on the following

i. Transcription process in eukaryotes (4 Marks)

ii. Limitations of using biochemical markers in crop improvement (5 Marks)

d) Outline reasons why you would advise farmers to grow *bt* cotton (5 Marks)

e) Assume you have been employed by University of Embu as a research assistant. You have received students from Chuka University who wants to learn the salient features of an ideal marker for use in plant breeding. Outline your points (5 Marks)

QUESTION TWO

Discuss *Agrobacterium* mediated plant transformation (20 Marks)

QUESTION THREE

a) Write short notes on
   i. What are Plant breeders rights (3 Marks)
   ii. Merits and demerits of plant breeders rights (10 Marks)

b) Write brief notes on western blotting as a molecular technique (7 Marks)

QUESTION FOUR

a) Discuss the three basic stages in polymerase chain reaction (PCR) and the principle behind each stage (10 Marks)

b) Discuss the applications of PCR in the contemporary world (8 Marks)

c) List any two techniques employed during protoplast transformation technique (2 Marks)

QUESTION FIVE

Assume that you are the Regional Head of the Biosafety Committee in Eastern Africa and has been invited by County Government in your home area to give a speech in a forum hosted by the county. Explain what you would tell the participants in regard to these two areas;

a) Myths and facts surrounding cultivation and utilization of genetically modified crops (11 Marks)

b) Benefits that Kenyans would get by embracing cultivation of transgenic crops (9 Marks)

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