

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

**UNIVERSITY EXAMINATIONS 2017/2018**

**YEAR 4 SEMESTER 1 EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN APPLIED BIOENGINEERING**

**HBB 2415: TRANSCIENCE PLANTS AND ANIMALS**

**DATE: DECEMBER 2017 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

QUESTION ONE

a) Differentiate between;

i) Totipotent, pluripotent and multipotent cells (3 marks)

ii) Protoplast and stem cells (2 marks)

iii) Transient and integrative transformants (2 marks)

iv) T-DNA and vir regions of a Ti plasmid (2 marks)

b) With the aid of diagrams, describe how the electroporation technique is used in generation of transgenics (6 marks)

c) What are the possible effects of transgenic organisms on the environment (3 marks)

d) Explain why a transgene construct of yeast glycerol-3-phosphate dehydrogenase (gpdi) can be used to improve crops. Which characteristic and which crops would it improve (4 marks)

e) List five possible negative effects of transgenic food to humans (5 marks)

f) Outline the main transgenic modifications done on climacteric crops/fruits, giving examples (3 marks)

QUESTION TWO

Discuss how you can develop a transgenic variety of lettuce that could potentially protect poultry from avian influenza (20 marks)

QUESTION THREE

Discuss the ethical issues associated with development of transgenic plants and animals (20 marks)

QUESTION FOUR

Discuss the impacts of transgenic plants and animals. Citing specific examples, in the agricultural industry (20 marks)