

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

**JOMO KENYATTA UNIVERSITY**

**OF**

**AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE**

**DEGREE BACHELOR OF SCIENCE IN BIOTECHNOLOGY/**

**BACHELOR OF SCIENCE IN MICROBIOLOGY**

**SBT 2442: GENETIC ENGINEERING I**

**DATE: DECEMBER 2015 TIME: 2 HOURS**

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

1. a) Explain briefly the effective uses of enzyme methods in

labeling nucleic acids. [5 marks]

b) Explain the uses of molecular DNA or RNA probes. [4 marks]

c) Outline the procedure for successful somatic hybridization. [6 marks]

d) Describe the structure of PUC and PTR 262 plasmids. [6 marks]

e) Describe FIVE methods of isolating DNA fragments for

gene cloning. [5 marks]

f) What important considerations would you make when doing

blunt-end ligation or single restriction enzyme site ligation? [4 marks]

1. Discuss the advantages and disadvantages of using cosmids

and yeast artificial cloning vectors as shuttle systems. [20 marks]

1. Discuss the synthesis of human insulin using recombinant DNA

technology. [20 marks]

1. Discuss how *agrobacterium tumefaciens* has been utilized in

genetic engineering. [20 marks]