



South Eastern Kenya University, School of Agriculture & Veterinary Sciences
Department of Dryland Agriculture
ACS 409: BIOTECHNOLOGY
BSc. Agriculture (4th Years); BSc. Agriculture (3rd Years);
BSc. Horticulture (3rd Years); BSc. Animal Science (4th Years);
1st Semester (2016/2017) Examination

Instructions: ANSWER ALL QUESTIONS IN SECTION A
ANSWER ANY TWO QUESTIONS IN SECTION B

Time: 2 hours

SECTION A (30 marks):

- 1) Briefly describe the following biotechniques.
 - a) Polymerase chain reaction (5 marks)
 - b) Agarose gel electrophoresis (5 marks)
- 2) Briefly explain six differences between RNA and DNA (6 marks)
- 3) Briefly describe the following important enzymes in biotechnology.
 - a) Restriction endonucleases (5 marks)
 - b) DNA Ligases (2 marks)
 - c) Reverse Transcriptase (3 marks)
- 4) Explain four roles of molecular markers in plant breeding (4 marks).

SECTION B (40 marks):

- 5) With examples, describe applications of biotechnology under the following topics:
 - a) Applications in Healthcare (Medicine) (8 marks)
 - b) Applications in Agriculture (8 marks)
 - c) Environmental applications (4 marks)
- 6) Describe three natural and two artificial gene transfer methods (20 marks).
- 7) Describe the five steps involved in creation of recombinant DNA (20 marks).