



UNIVERSITY OF EMBU

2016/2017 ACADEMIC YEAR

SECOND SEMESTER EXAMINATION

FIRST YEAR EXAMINATIONS FOR THE DEGREE OF MASTERS IN CROP
PROTECTION

ACP 609: BIOTECHNOLOGY AND MOLECULAR TECHNIQUES

DATE: APRIL 11, 2017

TIME: 2:00-5:00PM

INSTRUCTIONS:

Answer ANY FOUR Questions

QUESTION ONE

- a) Discuss the advantages of genetic transformation in plants (5 Marks)
- b) Outline any six benefits of growing *bt* crops in agriculture (6 Marks)
- c) Suppose you are the crop's officer in your home area and you are appointed to teach farmers on the benefits of growing tissue cultured crops. Outline the points (5 Marks)
- d) Assume you work for University of Embu and you have received students from Kianjai Polytechnic. The visitors want to learn the differences between eukaryotes and prokaryotic cells. Outline your notes (5 Marks)
- e) Outline any four causes of mutations in living organisms (4 Marks)

QUESTION TWO

- a) Discuss the applications of genetic engineering in agriculture (20 Marks)
- b) Outline the features of the T_i plasmids in *Agrobacterium* (5 Marks)

QUESTION THREE

- a) Discuss the requirements of polymerase chain reaction (PCR) (6 Marks)
- b) Discuss the applications of PCR (5 Marks)
- c) Assume that you are hired as a molecular biologist at International Livestock Research Institute. You have received visitors who want to learn the applications of molecular cloning. Discuss your notes (5 Marks)
- d) Discuss the reasons why plant breeders are using genetic markers in crop improvement (9 Marks)

QUESTION FOUR

- a) Discuss the following
 - i) Use of cell culture in incorporation of vaccines into the plant systems (5 Marks)
 - ii) Production of industrial enzymes and biodegradable plastics (5 Marks)
 - iii) Regulation of genetically modified plants in Kenya (5 Marks)
 - iv) Myths and facts surrounding development and utilization of transgenics (10 Marks)

QUESTION FIVE

- a) Explain the four main stages in risk assessment of a genetically modified product (8 Marks)
- b) Outline the function of DNA ligases (4 Marks)
- c) Assume that you are hired by the county government of Meru as a crop specialist. You are to give a talk to a group of farmers on how transgenics would contribute to food security and livelihoods among them. Discuss your notes (13 Marks)

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