



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.

Tel: 020-2069349, 061-2309217. 064-30320 Cell phone: +254 712524293, +254 789151411

Fax: 064-30321

Website: www.must.ac.ke Email: info@must.ac.ke

University Examinations 2015/2016

FOURTH YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF
BACHELOR IN HORTICULTURE

AHS 2401: AGRICULTURAL BIOTECHNOLOGY

DATE: NOVEMBER 2015

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- a) Describe the role of the following in cell signalling and plant growth and development;
- i) Plant cell signal receptors (2 Marks)
 - ii) Signalling substances (2 Marks)
 - iii) Transcriptional factors (2 Marks)
 - iv) Enzymes (2 Marks)
- b) Describe three main components of a DNA strand backbone. (6 Marks)
- c) Distinguish between DNA and RNA. (6 Marks)
- d) Outline five (5) advantages of tissue culture over conventional plant propagation methods. (10 Marks)

QUESTION TWO (20 MARKS)

- a) With examples discuss four plant growth hormones and their role in plant growth and development in Agricultural Biotechnology. (20 Marks)

QUESTION THREE (20 MARKS)

- a) *Bacillus Thuringiensis* (BT) has been dubbed as one of the greatest successes made so far in genetic engineering.
- i) Describe the role of BT in crop protection. (5 Marks)
 - ii) Where possible with a diagram, describe the identification, isolation, screening and incorporation of gene responsible for insecticidal effects from BT to BT cotton. (10 Marks)
 - iii) Plant defence and adaptation mechanisms depend entirely on signals that initiate tissue repair and subsequent growth and development. State mechanisms through which plant signals are received and transmitted to initiate plant tissue repairs. (5 Marks)

QUESTION FOUR (20 MARKS)

- a) Agricultural Biotechnology has gained momentum in the last few decades geared towards addressing various challenges in global food security.
- i) Discuss five areas that molecular biologists have focused on in the last two decades in genetic engineering geared towards crop improvement and productivity. (10 Marks)
 - ii) Discuss five main global challenges facing production and utilization of genetically modified plants. (10Marks)