



**SUPPLEMENTARY 2009/2010**

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**UNIVERSITY OF SWAZILAND**

**SUPPLEMENTARY EXAMINATION PAPER**

**PROGRAMME:                    BACHELOR OF SCIENCE IN HORTICULTURE  
   YEAR IV AND BACHELOR OF SCIENCE IN  
   AGRONOMY YEAR IV**

**COURSE CODE:                HORT 403**

**TITLE OF PAPER:             PLANT BIOTECHNOLOGY**

**TIME ALLOWED:              TWO (2) HOURS**

**INSTRUCTION:                ANSWER ANY FOUR (4) QUESTIONS**

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THE CHIEF INVIGILATOR**

ANSWER ANY FOUR (4) QUESTIONS

**Question 1**

- a) What is an aseptic condition? [3 marks]
  - b) What is the importance of Gel electrophoresis in biotechnology? [5 marks]
  - c) What are restriction enzymes and name their types. [5 marks]
  - d) What is the importance of a carbon source in the MS media? [5 marks]
  - e) Describe the process of seed sterilization [7 marks]
- [25 marks]**

**Question 2**

- (a) What is recombinant DNA (rDNA)? [5 marks]
  - (b) Describe the methods of making Recombinant DNA. [12 marks]
  - (c) Give a **schematic** outline of Random Amplified Polymorphic DNA (RAPD) analysis. [8 marks]
- [25 marks]**

**Question 3**

- (a) What is a molecular marker? [2 marks]
  - (b) What are the general characteristics of genetic markers? [7 marks]
  - (c) Discuss the merits and demerits of GMO in Agriculture. [16 marks]
- [25 marks]**

**Question 4**

The release of transgenic materials is often under strict control and scrutiny. Describe the regulatory process for transgenic crops according to:

- a) Institutional Bio safety Committee (IBC). [12 marks]
  - b) Environmental Protection Agency (EPA) [13 marks]
- [25 marks]**

**Question 5**

Biotechnology is a potential threat to the survival of Agrobiodiversity.

Discuss? **[25 Marks]**

ANSWER ANY FOUR (4) QUESTIONS

Question 1

- (a) List **five** genetic and **five** non-genetic engineering techniques of plant improvement. [5 marks]
  - (b) Discuss any **two** of each technique. [20 marks]
- [25 marks].

Question 2

- (a) What is plant biotechnology? [5 marks]
  - (b) What are the potential benefits of plant biotechnology to agricultural production? [20 marks]
- [25 marks]

Question 3

- (a) Discuss the Restriction Fragment Length Polymorphism (RFLP) analysis. [15 marks]
  - (b) What are the problems associated with this method. [10marks]
- [25 marks]

Question 4

What are the steps involved in the selection and regeneration of transformed plant cells. [25 marks]

Question 5

- (a) What is a genetically modified organism (GMO)? [5 marks]
  - (b) Discuss the merits and demerits of GMO in agriculture. [20 marks]
- [25 Marks]