



**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

**MAIN EXAMINATIONS
MAIN CAMPUS**

FIRST YEAR SECOND SEMESTER EXAMINATIONS

**FOR THE DEGREE
OF
MASTER OF SCIENCE IN CROP PROTECTION**

COURSE CODE: BCP 823

**COURSE TITLE: CROP DISEASE EPIDEMIOLOGY &
MANAGEMENT**

DATE: THURSDAY, 21ST APRIL 2022

TIME: 9:00 – 12:00 P.M.

INSTRUCTIONS TO CANDIDATES

Answer ANY FOUR questions (60 marks)

TIME: 3 Hours

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over. 

1. A polycyclic seedborne disease of the beans' infection rate $r = 0.235/\text{day}$. Calculate the incidence of seed infection which will be maximum tolerable to keep the final incidence of the disease below 20%, assuming the bean cycle is 90 day season. (15 marks)

2. Management of epidemics revolves around reduction of the infection rate, initial inoculum and time of epidemic establishment. Discuss using case examples on how this has been achieved in crop protection in Kenya. (15 marks)

3. The following are outputs from field data analysis of disease incidence over time in days: Using the polycyclic and monocyclic linear models the functions; $y = 0.038x - 0.14$ with R^2 value of 0.982 and $y = 0.020x - 0.05$ with R^2 value of 0.879 were obtained respectively. Identify the disease cycle that best describes the data and predict the initial disease levels of that field if by day 50 the disease levels were at 45%. (15 marks)

4. Two maize varieties Katumani and DK80 were being evaluated. The infection rate of a certain maize mosaic virus strain in the two varieties was determined at 0.215 and 0.103 respectively. Determine the variety which is relatively tolerant to the strain based on the level of disease after seven months of the crop cycle if the initial disease incidence for both varieties was estimated at 15%. (15 marks)

5. Discuss the pre-requisites of developing a forecast system of a plant epidemic. (15 marks)