****

**W1-2-60-1-6**

##  JOMO KENYATTA UNIVERSITY

**OF**

**AGRICULTURE AND TECHNOLOGY**

# University Examinations 2012/2013

**THIRD YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN HORTICULTURE AND ENVIRONMENTAL HORTICULTURE AND LANDSCAPING**

**AHS 2303 :** **PLANT PATHOLOGY**

**DATE: AUGUST 2012 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER ALL QUESTIONS. TOTAL MARKS 70.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**QUESTION ONE**

Explain the difference between the following terms as applied in plant pathology:

(a) Incubation period and latent period.

(b) Hallo and virtual lesion.

(c) Disease severity and disease incidence.

(d) Viroids and virions.

(e) Biotic and abiotic diseases. [10 marks]

**QUESTION TWO**

In a nearby golf course, epidemics of damping-off disease caused by *Rhizoctonia* spp. and Rust caused by *Puccinia* sppwere reported on Turf grasses. You were contacted to advice on the management of the two diseses:

(a) Illustrate the disease cycles in which each of the two fungi undergo. [4 marks]

(b) Briefly explain how you would diagnose the two diseases and any other fungal diseases. [4 marks]

(c) With reference to Van der Plank’s understanding of the disease cycles, relate the two diseases with money deposited in a bank.

 [4 marks]

(d) State at least four ways in which this analog in (iii) above breaks down. [4 marks]

(e) Briefly explain how you would manage the two diseases in the field. [4 marks]

**QUESTION THREE (20 MARKS)**

Bean rust casual fungi, *Uromyces appendiculatus*, was inoculated to a mildly susceptible bean plants in a field and conditions were artificially made favourable for infections.

(a) Explain all possible pre-infection structural and chemical defense

mechanisms that would make this plant tolerant to the disease.

 [8 marks]

(b) Once established histological defence mechanism may play a role in the plant defence or tolerance to the disease, explain at least four histological structures the bean plant may utilize to protect itself against the fungi. [8 marks]

(c) Due to market demand, new bean varieties that are more susceptible were introduced in the same area and there is potential the disease may reach epidemic levels. You are sent out on an advisory mission to advise farmers of the activities they should practice to manage the disease at below epidemic levels. Explain at least three methods you would advise them to adopt.

 [9 marks]

**QUESTION FOUR (20 MARKS)**

You have been employed by ‘Geneca’ a company that specializes on developing herbicide tolerant plants. Kenya Seed Company approached you to develop plants that are tolerant to a common broad spectrum herbicide.

(a) Explain possibilities you would consider to acquire those genes for herbicide tolerance. [8 marks]

(b) The environmentalists have raised concerns and a memorandum was raised to the responsible government bodies. Anticipate what concerns the above memorandum would contain having in mind that the environmentalists are highly informed. [7 marks]