Candidates are admitted to the examination room ten minutes before the start of the examination. On admission to the examination room, you are permitted to acquaint yourself with the instructions below and to read the question paper.

Do not write anything until the invigilator informs you that you may start the examination. You will be given five minutes at the end of the examination to complete the front of any answer books used.

April 2011

Answer Book
General Data Sheet
Any bilingual English language dictionary permitted
Only Casio-fx83 calculators are permitted

THE UNIVERSITY OF READING

MSc Examination for Courses in Sciences

Vegetation, Agriculture and the Atmosphere

MTMA40

2 hours

Answer **ANY TWO** questions

The marks for the individual components of each question are given in [ ] brackets.
The total mark for the paper is 100

1. (a) Describe how the actual evapotranspiration of a crop usually varies as soil moisture content decreases from field capacity to permanent wilting point. Explain the current FAO method for estimating the soil moisture deficit (in mm) at which irrigation is required to avoid effects of water stress on growth. Include in your answer numerical estimates of this deficit for two contrasting combinations of soil type and crop species.

[25 marks]

(b) Describe the effects of a shelterbelt on the microclimate of the surrounding area and how the characteristics of a shelterbelt affect these changes. Discuss the applications of shelterbelts in both temperate and tropical regions.

[25 marks]

2. (a) Define thermal time. Describe the use of thermal time in understanding environmental effects on plants and in predicting crop response to temperature. Discuss applications of thermal time in agricultural climatology.

[25 marks]

(b) Define radiation use efficiency as used in studies of crop growth. Describe how values of radiation use efficiency can be calculated from suitable experimental data and how the concept can be used to examine agronomic, environmental and genetic influences on crop growth.

[25 marks]

3. Explain the roles of meteorological factors in:

(a) the spread of foot and mouth disease in animals

[25 marks]

(b) the development of potato blight in crops

[25 marks]

In both (a) and (b) comment briefly on the relative importance of meteorological and other factors and discuss how meteorology can contribute to forecasting the spread or the development of the disease.

(End of Question Paper)