



JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2016/2017

**SECOND YEAR FIRST SEMESTER UNIVERSITY EXAMINATION FOR THE
DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE**

ALP 2305: AGROMETEOROLOGY & CROP WATER REQUIREMENT

DATE: DECEMBER, 2016

TIME: 2 HOURS

**INSTRUCTIONS: ANSWER SECTION A (COMPULSORY) AND ANY OTHER
QUESTIONS**

Constants: $\frac{\Delta}{r} = 0.738$.

$$\frac{r}{\Delta + r} = 0.262$$

$$A = 6.02 \times 10^{23} \text{ Photons/mol}$$

$$c = 3.0 \times 10^8 \text{ m/s}$$

$$h = 6.626 \times 10^{-34} \text{ J s/photon}$$

SECTION A:

QUESTION ONE: 30 MARKS

- a. i. List the main importance of Agrometeorology. [2 ½ marks]
- ii. Using a sketch of standard layout of an Agrometeorology field station. Indicate the positions of:-
- Anemometer
 - Sunshine recorder
 - Evaporation pan
 - Stevenson screen [3 marks]
- b. i. Define the following terms:-
- Relative humidity
 - Specific humidity
 - Vapour pressure
 - Saturated vapour pressure [2 marks]
- ii. At an Agrometeorology station, air pressure is measured as 100kPa, air temperature as 18^oc and the wet bulb temperature as 14^oc.

Calculate:

- Vapour pressure.
- Relative humidity.
- Specific humidity.
- Air density.

[3 marks]
[2 marks]
[2 marks]
[3 ½ marks]

iii. Explain in details the following:-

I. Diurnal variation of relative humidity.

[3 marks]

II. The effect of relative humidity on

- Leaf growth.
- Photosynthesis.
- Pollination.

[3 marks]
[3 marks]
[3 marks]

SECTION B:

QUESTION TWO:

a. Explain in details the following types of drought:-

i. Meteorological.

ii. Agricultural.

iii. Hydrological.

[9 marks]

b. The electromagnetic energy (E), emitted by the sun is given as $E =$

$$\frac{h c}{\lambda}$$

i. Define the terms in the equation.

[2 marks]

ii. Calculate Energy emitted by the following parts of the electromagnetic spectrum.

I. Blue – 500nm

II. Cyan – 550nm

III. Red – 700nm

[6 marks]

c. Explain in detail the main parts of the electromagnetic spectrum that affect crop growth.

[3 marks]