UNIVERSITY OF FORT HARE

ELEMENTARY IRRIGATION
AGC 221

SUPPLEMENTARY EXAMINATIONS

JANUARY 2014

Time: 3 Hours
Subject: AGC 221
Marks: 100

This paper consists of 3 pages including the cover page

Internal Examiners

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INSTRUCTIONS

Answer all FIVE questions
Question 1. Complete the sentences below (20 Marks).

(i) ____________ is the relative proportions of sand, silt and clay of soil
(ii) Irrigation method that applies water in frequent, low volume and low pressure is called ____________
(iii) An underground layer of gravel, earth or porous rock which contains water is called ____________
(iv) Surface irrigation applies water ____________
(v) ____________ refers to irrigated land that is flat and enclosed by a barrier to prevent runoff
(vi) The water needed for both evaporation and transpiration is also called ____________
(vii) The term Water Holding Capacity means ____________
(viii) ____________ is the measure of how fast the soil will take in water
(ix) ____________ supplies water to plants by diverting the water from a natural source to an artificial channel
(x) Soil structure refers to ____________

Question 2. (20 Marks).
List the problems that are caused by poor irrigation water quality

Question 3. (20 Marks).
Describe how poor drainage of agricultural land affects each of the following
(a) Aeration
(b) Soil temperature
(c) Farm operations
(d) Pests and diseases

Question 4. (20 Marks).

According to the Green-Ampt model, infiltration rate \(i_t\) at time \(t\) is related to the final steady state infiltration, \(i_c\) and cumulative infiltration, \(I\). Thus \[ i_t = i_c + \frac{b}{I} \]

Where \(b\) is a constant.
In a certain irrigated field the infiltration rate was 15 mm h\(^{-1}\) when 80 mm depth of irrigation water was applied. If the final steady state infiltration rate was 4 mm h\(^{-1}\), calculate the depth of irrigation water when the infiltration rate was 8 mm h\(^{-1}\).

**Question 5. (20 Marks).**

List five considerations for the selection of an irrigation method.

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