UNIVERSITY OF FORT HARE

ELEMENTARY IRRIGATION
AGC 221

SUPPLEMENTARY EXAMINATIONS

JANUARY 2019

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Time:	**3 HOURS**
Subject:	**AGC 221**
Marks:	**100**

This paper consists of 3 pages including the cover page

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INSTRUCTIONS

ANSWER ALL QUESTIONS

Answer all question in brief

Question 1 [20]

1. Define the following:
   i. Infiltration (3)
   ii. Drainage (3)
   iii. Irrigation efficiency (3)
2. List the sources of water for irrigation (5)
3. Calculate the irrigation water requirement if the crop water requirement is 350 mm and the effective rainfall is 70 mm. (2)
4. List the most important soil properties influencing irrigation (4)

Question 2 [20]

1. Explain problems associated with wet soils [4]
2. Explain how the specific toxicity problems can be managed [4]
3. Name the two major drainage network in South Africa (2)
5. Explain what is likely to happen in the following scenarios, if the infiltration rate of the soil is 15 mm/hr:
   i. Rainfall intensity is 25 mm/hr (5)
   ii. Rainfall intensity is 10 mm/hr (5)

Question 3 [20]

a) Explain the three components of efficiency of water use in irrigation. (5)

b) Describe the three methods of surface irrigation. (5)

c) Calculate the total available water (TAW) and readily available water (RAW) from the information given in the table below. **(10)**

Crop root depth (cm)	Depletion factor (p)	FC ($m^3\ m^{-3}$)	PWP ($m^3\ m^{-3}$)
50	0.3	0.40	0.15
100	0.7	0.30	0.10

Question 4 [20]

1. Give five components of drip irrigation system (5)
2. Outline any two systems by which drainage in agricultural land can be achieved. (5)
3. Discuss about the duration of irrigation run (5)
4. Describe the four stages of crop growth in reference to their sensitivity to water shortages (5)

Question 5 [20]

a) State any five advantages of sprinkler irrigation over the surface irrigation system. (5)

b) Discuss the crops that are not suitable to be irrigated by sprinkler irrigation. (5)

c) Answer the questions below based on the following given data of water use for irrigation:

Water inflows into the dam = 1000 m^3

Water outflow from the dam = 900 m^3

Total water losses in the dam = 100 m^3

Water delivered to irrigation plots = 600 m3.

Water loss in the conveyance = 300 m^3

Water used by plants during evapotranspiration = 520 m^3

Effective rainfall = 50 m^3

Calculate the:

i. storage efficiency [2]

ii. conveyance efficiency [2]

iii. irrigation efficiency [2]

iv. total efficiency of water use for irrigation [4]