



**COLLEGE OF AGRICULTURE, FISHERIES & FORESTRY**

**School of Agricultural Sciences**

**Department of Crop Production**

**Trade Diploma in Agriculture – Year 2**

**AGO 507: Irrigation and Water Management**

**Trimester 2 Final Examination 2017**

**[Total Marks: 100]**

Time Allowed : 3 hours plus 10 minutes reading time

Instructions : This paper consists of 7 pages.

Please check to see that your paper is complete.

Answer ALL questions in the answer booklet. Number your answers correctly in the answer booklet.

Write your student ID number on all the pages that you use including any additional sheet of paper.

Printed or written material is not allowed into the examination hall.

Mark values appear at the end of each question or part thereof.

Non-programmable calculators are permitted.

**“MOBILE PHONES ARE STRICTLY NOT ALLOWED”**

<b>SECTION</b>	<b>DESCRIPTION AND MARK ALLOCATION</b>
<b>SECTION A</b>	Part 1 - Multiple Choice Questions – 10 Marks
	Part 2 – Matching – 10 Marks
	Part 3 – True or False – 10 Marks
	Part 4 – Fill in the Blanks – 10 Marks
<b>SECTION B</b>	Short Answer Questions – 30 Marks
<b>SECTION C</b>	Long Answer Questions – 30 Marks

Write the most appropriate answer of your choice in the answer booklet

1. The movement of water from the soil surface into the soil profile is known as
  - A. Soil porosity
  - B. Water holding capacity
  - C. Water Infiltration
  - D. Soil texture
  
2. Which of the following conditions is suitable for flood irrigation?
  - A. Scant Rainfall
  - B. Planting rice
  - C. Steep Slope
  - D. All the above
  
3. The impact of a falling rain drop creates a small crater in the soil rejecting soil particles:
  - A. Stream bank erosion
  - B. Rill Erosion
  - C. Splash Erosion
  - D. None of the above
  
4. Amount of water required by a crop in its whole production period is called?
  - A. Sprinkler
  - B. Ground water
  - C. Water requirement
  - D. Consumptive water
  
5. During a prolonged dry period, which of the following system will be more efficient in irrigating your crops?
  - A. Sprinkler
  - B. Furrow Irrigation
  - C. Drip irrigation system
  - D. Basin Irrigation

6. Which of the following is not an example of surface irrigation system?
- A. Basin
  - B. Border Irrigation
  - C. Sprinkler Irrigation
  - D. Furrow
7. The natural application of water to crops by rainfall is referred to as:
- A. Rain-fed farming
  - B. irrigation system
  - C. Flooding system
  - D. None of the above
8. The artificial application of water to water in the form of spray as rain is known as:
- A. Sprinkler Irrigation
  - B. Drip irrigation
  - C. Sub surface irrigation
  - D. Furrow irrigation
9. Plants that require less amount of water to grow optimally are called?
- A. Sensitive crop
  - B. Occasional water zone plants
  - C. Drought tolerant
  - D. All the above
10. The phreatic zone, or zone of saturation, is the area in an aquifer, below the water table, in which relatively all pores and fractures are saturated with water
- A. Infiltration Zone
  - B. Zone Of Saturation
  - C. Vadose zone
  - D. All the Above

**PART 2**

**MATCHING**

**[10 Marks]**

**Match List A with the corresponding correct answer from List B and write the answer in the answer booklet provided.**

#	Section A		Section B
1	Soil-water plant relationship	A	is the most common form of surface irrigation, particularly in regions with layouts of small fields

2	Irrigation water need	B	= Crop water need – available rainfall
3	Ground Water Recharge	C	The main agents of soil erosion
4	Splash Erosion	D	Occurs when thin layer of the top soil are moved by the force of run-off water leaving the surface uniformly eroded.
5	Ground water recharge	E	Is a hydrologic process where water moves downward from surface water to underground
6	Basin Irrigation	F	Some plants require large amounts of water. These plants typically grow in marshy areas, bogs, or along the banks of rivers, streams and lakes.
7	Zone of Saturation	G	Is the area an aquifer, below the water table, in which relatively all pores and fractures are all filled with water.
8	Wind and Water	H	The movement of moisture and energy, among soil, and plant.
9	High Water Requirement	I	These plants do not need to be watered every day, but they need to be watered when the soil has been dry for over a week or two.
10	Field Capacity	J	Is the moisture content of a soil on oven dry basis when it has been completely saturated and downward movement of excess water has practically stopped

**PART 3**

**TRUE OR FALSE**

**[10 Marks]**

In the Answer booklet provided write “TRUE or FALSE” if the statement is correct and “FALSE” if the statement is incorrect.

Sl.no.	Statements	T or F
1	Slow soil permeability is characteristic of a coarse soil with granular sub soils which tend to be loose when wet.	
2	Turgidity refers to the ability of cells to retain their shape by the force of water pressing against the inside of the cell walls.	
3	<i>Daucus Carota</i> grows best when its roots are submerged in water and so basin irrigation is the best method to use for this crop	
4	Drought-tolerant plants can thrive in hot, dry conditions with very little water.	
5	Strip cropping is a technique that serves to control erosion and increase water absorption thereby maintaining soil fertility and plant response	
6	Sprinkler irrigation is by far the most common form of irrigation throughout the world	
7	Soil texture and structure greatly influence water infiltration, permeability, and water-holding capacity	
8	Unavailable water is soil moisture that is held so tightly by the soil that it cannot be extracted by the plant.	
9	Sugar cane has the highest crop water need ranging from 1500-2500	
10	If the slope of the ground is level the water requirement will be more due to less absorption time for the soil.	

**PART 4**

**FILL IN THE BLANKS**

**[10 Marks]**

Fill in the blanks to complete the following statements. Write your answers in the answer booklet.

1. \_\_\_\_\_ is an artificial process by which saline water (generally sea water) is converted to fresh water.
2. \_\_\_\_\_ % of the water on the Earth is salt water and only three percent is fresh water; slightly over two thirds of this is frozen in glaciers and polar ice caps. .
3. \_\_\_\_\_ avoids flooding the entire field surface by channeling the flow along the primary direction of the field using 'creases,' or 'corrugations.
4. \_\_\_\_\_ mode of farming in regions of scant rainfall, relying on suitable crops and water retentive tillage methods.
5. \_\_\_\_\_ the amount of water that could be lost by evapotranspiration.
6. The entire field set up for irrigation and left until harvest. The setup is done at the time of planting or seeding and left until the produce is harvested from the field is called \_\_\_\_\_.
7. \_\_\_\_\_ somewhat equally substitute for tile drains is made by cutting narrow V shaped drains or rectangular in section, as for box drains, filling them up with rough stones large and small and then covering the whole up with soil level with surface field soil.
8. The \_\_\_\_\_ contributes largely to the filling of grains because it supplies photosynthetic products, mainly to the panicle.
9. \_\_\_\_\_ is the deposition of moisture from the atmosphere on the earth's surface.
10. \_\_\_\_\_ is the study of the relevant characteristics of watershed aimed at sustainable distribution of its resources and process of creating and implementing plants, programs and projects to sustain and enhance watershed functions.

**SECTION B****SHORT ANSWER QUESTIONS****[30 Marks]****[Each question is worth 3 marks]****All are compulsory**

1. Explain in your own words what you understand by the phrase "Oceans, rivers, clouds and rain - all contain water in a frequent state of change"? **(3 Marks)**
2. Briefly describe two factors which influence the irrigation requirement of crops? **(3 Marks)**
3. Define Tensiometer. **(3 Marks)**
4. What does a high value reading on the tensiometer indicate and what does a low value reading value indicate? **(3 Marks)**
5. List 3 factors which affects the rate of Evaporation and Transpiration in brief. **(3 Marks)**
6. Explain with a suitable example "depth of irrigation" in regards to the Crop water needs. **(3 Marks)**
7. Differentiate between Rainfed Agriculture and Irrigated Agriculture **(3 Marks)**
8. Briefly discuss the major difference between Crop period and base period? **(3 Marks)**
9. Briefly discuss 3 roles of water in regards to soil and 3 roles of water in regards plants? **(3 Marks)**
10. What influence does water table and slope of the ground have on crop water needs? **(3 Mark)**

This section consists of 3 long answer questions. All are compulsory.

1. Discuss five advantages and disadvantages of the drip irrigation and sprinkler irrigation system? (10 Marks)
  
2. What are the different components of the hydrological cycle and with the help of a diagram draw the hydrological Cycle. (10 Marks)
  
3. Using the data given below, determine the mass of the soil solid, mass of pore water and water content of both the samples. Use the formulae discussed in the practical class. (Show all the workings) (10 Marks)

Specimen number	1	2
Moisture can and lid number	10	12
$M_c$ = Mass of empty, clean can + lid ( grams)	9.97	8.83
$M_{CMS}$ = Mass of can, lid, and moist soil ( grams)	19.3	16.43
$M_{CDS}$ = Mass of can, lid and dry soil (grams)	15.28	12.69
$M_s$ = Mass of soil solids (grams)		
$M_w$ = Mass of pore water (grams)		
$W$ = Water content, w%		

**The End**