



FACULTY OF FISHERIES AND MARINE SCIENCES & TECHNOLOGY

Bachelor of Science Honors in Fisheries and Marine Sciences Degree/ Bachelor of Science Honors in Marine and Freshwater Sciences Degree

Level IV, Semester-I Examination -2023/2024

LIM 4112: Irrigation

Time: 1 hour and 30 minutes

Answer **all** the questions in **Section A** and **any two** questions in **Section B**.

Section A

1. Determine the Irrigation Demand per unit area for 145 days low-land paddy cultivation starting from 1st of May by considering the following key factors.
 - Land Preparation will be done in 2 staggers with each taking 20 days.
 - Water requirement for Land Preparation is 200 mm for 20 days.
 - The crop cultivation period is 105 days for paddy in the Yala season.
 - Crop Coefficient (K_c) for paddy in Yala Season is as given in Table 1-1

Table 1-1

Stage	Initial	Crop Development	Mid-Season	Late Season
Days	20	30	30	25
K_c	1.0	1.15	1.2	0.9

- Farm Loss: 150 mm per 31-day month.
- The canals in the area are unlined (The conveyance loss value in the case of an unlined canal is 30%).
- Effective Rainfall, from May to September is 80, 43, 17, 33, and 54 mm respectively.
- Reference Crop Evapotranspiration (ET_o), May to September is 155, 169, 193, 185 and 178 mm respectively.

- In answering this question Use a table in the following format.

Table 1-2

Month	May	June	July	August	September
	31 days	30 days	31 days	31 days	30 days
ET ₀					
Assuming 2 staggers and a 20 day for each section land preparation (The second stage of land preparation will commence after the completion of the first stage)					
Stage1					
Stage 2					
ET (S ₁)					
ET (S ₂)					
ET _c					
Land Preparation					
Farm Loss					
Field Water Requirement (FWR)					
Effective Rainfall (ER)					
Field Irrigation Requirement					
Irrigation Demand					

(40 marks)

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Section B

(Answer **only two (2)** questions)

2. Soil water supports plant growth, replenishes groundwater supplies, and maintains soil fertility. The classification of soil water includes hygroscopic water, capillary water, and gravitational water, each varying in retention and availability to plants.
- Describe the three main types of soil water including their characteristics, movement, and availability to plants. (06 marks)
 - Discuss the concepts of Permanent Wilting Point and Field Capacity, explaining how they are used in irrigation planning and management. (10 marks)
 - Explain how to select an appropriate irrigation method based on soil properties, climate conditions and crop type. (14 marks)
3. Irrigation projects require careful planning and design to ensure efficient water distribution and agricultural productivity. A well-planned canal system, designed based on a proper feasibility study, is essential for developing a sustainable and efficient irrigation project.
- Draw and label a schematic diagram of an irrigation canal system and explain the main function of each component. (08 marks)
 - Explain the key considerations in the design of canal layout in gravity-fed irrigation projects. (10 marks)
 - Describe the basic features of a feasibility study for an irrigation project. (12 marks)
4. Write short notes on **any four** of the following topics:
- Drip Irrigation
 - Sprinkler Irrigation
 - Furrow Irrigation
 - Irrigation Drawings and Drafting Standards
 - Reservoir Operation Study (30 marks)

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