UNIVERSITY OF RUHUNA

FACULTY OF FISHERIES AND MARINE SCIENCES & TECHNOLOGY

Academic Year 2023/2024

Bachelor of Science Honours in Marine and Freshwater Sciences Degree

Level IV Semester I Examinations – April- May 2025

LIM 4142: Water Transport and Distribution **Time: 1 ½ hrs**

Total Marks: 85

Answer all questions.

1. The following table gives data related to the population in a city by decades from 2000 to 2020. Apply the incremental increase method and predict the population for the year 2040 in the city.

(10 marks)

Year	Population
2000	455,000
2010	570,000
2020	715,000

2. Calculate the Probable Peak Hour Water Demand of a water supply system using the following information.
   - Average probable hourly water demand: 2 L/h/person
   - Number of persons using the service of water supply: 10,000

(05 Marks)

3. Determine the capacity of the water storage reservoir required to supply a 24-hour constant rate of 10,000 L/hour. The maximum deficit and surplus in the water supply system are 15,000 L and 4000 L, respectively.

(05 Marks)

4. Describe five factors to be considered for selecting suitable pipeline materials in a water distribution system.

(15 Marks)

5. Using the data given in the following table, calculate the Net Present Value (NPV) of capital investment for installing a water distribution system.

Cost for water pumps (Rs)	The service life of pumps (years)	Design period (years)	Annual Operation and Maintenance cost (Rs)
100,000	20	25	20,000

(10 Marks)

6. A pipeline with a length of 300m is connected to another pipeline of 200m. The diameters of the pipelines are 20cm and 25cm respectively. The water discharge through the pipeline is 0.30 m^3/s and the friction value is 0.02. Calculate the headlosses of the pipelines.

(10 Marks)

7. Discuss the importance of operation and maintenance in water transport networks for better functioning of the system integrity. **(30 Marks)**

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Note: 15 Marks are allocated for Continuous Assessment