5.0 OBJECTIVE

After completing this practical exercise, you should be able to:

- calculate the storage capacity of water storage structures.

5.1 INTRODUCTION

Different types of storage structures of different cross-sections i.e. cylindrical, rectangular, square are used for storing roof top rainwater as shown in Fig.5.1. The cylindrical shape structures are considered most appropriate. The size of the storage structure depends on the amount of rainfall, purpose, per capita water use, number of persons in a household or a group housing society and period of water scarcity. The correct estimation of storage capacity is of vital importance from cost of storage tank and future planning considerations.

Fig.5.1: Different types and shapes of tanks
5.2 EXPERIMENT

5.2.1 Requirements
- Measuring tape; and
- Calculator.

5.2.2 Procedure

1) Measure the dimensions of tank.
   i) Rectangular tank: length \( L \), breadth \( B \) and depth \( H \).
   ii) Cylindrical tank: diameter \( D \) and depth \( H \).

2) Measure area of cross-section of tank.
   i) Rectangular tank: Area \( A = L \times B \)
   ii) Cylindrical tank: Area \( A = \frac{\pi D^2}{4} \)

3) Calculate storage capacity (volume) of a tank \( V = A \times H \)

5.3 OBSERVATIONS AND CALCULATIONS

Example 5.1

Storage capacity of different shapes of tank

Rectangular
\[ L = 2.8 \text{ m} \]
\[ B = 1.0 \text{ m} \]
\[ H = 0.8 \text{ m} \]
\[ A = 2.8 \text{ m}^2 \]
\[ V = 2.24 \text{ m}^3 \]
\[ = 2240 \text{ litre} \]

Cylindrical
\[ D = 1.0 \text{ m} \]
\[ H = 1.28 \text{ m} \]
\[ A = 0.785 \text{ m}^2 \]
\[ V = 1.0 \text{ m}^3 \]
\[ = 1000 \text{ litre} \]

Exercise 5.1

Determine the storage capacity of rectangular and cylindrical tanks

Storage capacity of different shapes of tank
5.4 RESULTS

Storage capacity of different shapes of tank

i) Rectangular

\[ V = L \times B \times H \]

\[ = \ldots \ldots \ldots \ldots m^3 \]

\[ = \ldots \ldots \ldots \ldots \text{litre} \]

ii) Cylindrical

\[ V = \pi D \times H \]

\[ = \ldots \ldots \ldots \ldots m^3 \]

\[ = \ldots \ldots \ldots \ldots \text{litre/sec} \]