COURSE TITLE : HYDRAULICS LABORATORY
COURSE CODE : 319
COURSE CATEGORY : B
PERIODS/WEEK : 3
PERIODS/SEMESTER : 54
CREDITS : 2

TOPIC

1. Bernoulli's theorem apparatus
2. Orifices (circular)
3 Notches (Rectangular ,Triangular, Trapezoidal)
4. Venturimeter
5 Pipe friction apparatus
6 Pelton turbine,
7 . Centrifugal pump
8 Reciprocating pump
9. Hydraulic Ram
10 Study of Pipe fittings, joints and valves.

OBJECTIVES

1**. Bernoulli's** theorem apparatus
1.1.0 Demonstrate the use of Bernoulli's theorem apparatus
1.1.1 Explain Bernoulli's theorem
1.1.2 Verify Bernoulli's theorem using the apparatus
1.1.3 Draw the graph- total energy Vs Length of pipe
1.1.4 Interpret the curve.

2. **Orifices (**circular)
2.1.0 Appreciate the coefficient of discharge through orifices
2.1.1 Demonstrate circular orifices and its functions
2.1.2 Determine the coefficient of discharge
2.1.3 Plot the graph – coefficient of discharge Vs discharge
2.1.4 Comments on graph.

3 **Notches**
3.1demonstrate different type of Notches
3.1.1 Determine the coefficient of discharge of Rectangular Notch
3.1.2 Determine the coefficient of discharge of triangular Notch
3.1.3 Plot the graph coefficient of discharge Vs discharge.

4**. Venturimeter**
4.1.0 Appreciate the coefficient of discharge through venturimeter
4.1.1 State the function and application of a venturimeter
4.1.2 Determine the coefficient of discharge
4.1.3 Plot the graph discharge Vs head
4.1.4 Comments on curve.

5 Pipe friction apparatus
5.1.0 Use the pipe friction apparatus to determine the coefficient of friction
5.1.1 Explain the term coefficient of friction in pipes
5.1.2 State the effort of friction in pipes
5.1.3 Determine the coefficient of friction of pipes of different diameters
5.1.4 Plot total energy line and hydraulics gradient line
5.15 Comments on the graph.

6. Open Channel apparatus
6.1.0 Explain the terms Chezy's Constant, Hydraulic gradient and Hydraulic mean depth
6.1.2 Determine the Chezy's constant for varying slope and discharge.

7. Pelton Turbine
7.1.0 Study the Pelton turbine
7.1.1 Distinguish the characteristics curves of Pelton turbine
7.1.2 Find the efficiency at constant head and constant speed
7.1.3 Plot the characteristics curves
7.1.4 Interpret the curves.

8. Francis turbine and Kaplan turbine
8.1.0 Study the Francis turbine and Kaplan turbine
8.1.1 Distinguish the characteristics curves of above turbines
8.1.2 Find the efficiency at constant head and constant speed
8.1.3 Plot the characteristics curves
8.1.4 Interpret the curves.

9. Centrifugal pump
9.1.0 State the function and principle of working of centrifugal pump
9.1.2 State the applications
9.1.3 Conduct experiment and find out hydraulic efficiency and overall efficiency
9.1.4 Plot the characteristic curves and comment on it.

10. Reciprocating pump
10.1.0 State the function and principle of working of reciprocating pump
10.1.2 State the applications
9.1.3 Conduct experiment and find out volumetric efficiency and overall efficiency
9.1.4 Plot the characteristic curves and comment on it.

11. Hydraulic ram
11.1.0 State the function of hydraulic Ram
11.1.1 Explain the working of hydraulic Ram
11.1.2 Conduct the experiment on hydraulic Ram
11.1.3 Construct the graph – discharge versus efficiency of hydraulic ram
11.1.4 Plot the graph – discharge Vs D'Abuisson's efficiency and Rankine efficiency
11.1.5 Interpret the above curves.

Note :- Conduct at least 8 experiments