**Practical No. 05**

**Object:** Determine the pressure of pump using bourdon guage

**APPARATUS:** Hydraulic Bench,bourdon tube guage , centrifugal pump

**THEORY:**

**The Hydraulic Bench**

It provides facilities for performing a number of hydraulic experiments. A small centrifugal pump drawing water from sump which lies blow the bench delivers to experimental apparatus placed on top bench. The flow rate is controlled by valve in supply lin and measured before return to dump from recirculation. Using weight –time method the discharge is measured by timing the filling of a tank that is counter weighted.

**Centrifugal Pump:**

A **centrifugal pump** is a rotodynamic pump that uses a rotating impeller to create flow by the addition of energy to a fluid. Centrifugal pumps are commonly used to move liquids through piping. The fluid enters the pump impeller along or near to the rotating axis and is accelerated by the impeller, flowing radially outward into a diffuser or volute chamber (casing), from where it exits into the downstream piping.

**Equation of Continuty:**

A **continuity equation** in physics is an [equation](http://en.wikipedia.org/wiki/Equation) that describes the transport of a [conserved quantity](http://en.wikipedia.org/wiki/Conserved_quantity). Since [mass](http://en.wikipedia.org/wiki/Mass), [energy](http://en.wikipedia.org/wiki/Energy), [momentum](http://en.wikipedia.org/wiki/Momentum), [electric charge](http://en.wikipedia.org/wiki/Electric_charge) and other natural quantities are conserved under their respective appropriate conditions, a variety of physical phenomena may be described using continuity equations.

Continuity equations are the (stronger) local form of [conservation laws](http://en.wikipedia.org/wiki/Conservation_law). All the examples of continuity equations below express the same idea, which is roughly that: *the total amount (of the conserved quantity) inside any region can only change by the amount that passes in or out of the region through the boundary*. A conserved quantity cannot increase or decrease, it can only move from place to place.

**Q=** The volumetric flow rate

**A=**Cross sectional Area of flow

**V=**The mean velocity

**Observation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| S.no | Starting volume level (liters) | Final volume level (liters) | Difference in volume  |  Time (Seconds) | Flow (liters) |
| 1. | 0 | 8.5 | 8.5 | 10 | 0.85 |
| 2. | 8.5 | 19 | 10.5 | 10 | 1.05 |
| 3. | 19 | 30 | 11 | 10 | 1.10 |
| 4. | 30 | 40 | 10 | 10 | 1.00 |
| 5. | 40 | 49 | 9 | 10 | 0.90 |