Assignment: 2 STATIC FORCES ON SURFACE AND BUOYANCY

1. Explain force on a curved surface due to hydrostatic pressure. Derive an expression of resulting horizontal, vertical and resultant force on a curved surface immersed in a liquid.

2. Define total pressure and centre of pressure.

3. Derive the expression for total pressure and centre of pressure for a vertical plate submerged in liquid with usual notations.

4. Explain the conditions of stability for a submerged and floating body with neat diagrams.

5. Prove that the centre of pressure for any immersed surface always lies below its centroid.

6. Distinguish between centre of pressure and centre of gravity.

7. Define: Force on buoyancy, metacentre, centre of buoyancy and metacentric height.

8. Explain the conditions of stability for submerged body.

9. Show that the distance between the metacentre and centre of buoyancy is given by $BM = \frac{I}{V}$.