B. Tech. (Mechanical Engineering), 4th Semester
Subject Name: Fluid Mechanics (MEC-406)
Minor-I

Time allowed: 1.5hrs. **Max. Marks: 30**

Note: All questions are Compulsory.

Q. 1 i) Explain the variation of viscosity with temperature for fluids.

ii) Explain the types of fluid with suitable examples. **(02x03=06)**

Q. 2 Write the conditions for stable, unstable and neutral equilibrium of submerged and floating body. Explain one example of both cases. **(06)**

Q. 3 A U-tube manometer shown in **Fig. 1** is used to measure the gauge pressure of a fluid P of density=800 kg/m^3. If the density of the liquid Q is 13.6x10^3 kg/m^3, what will be the gauge pressure at A if a) h_1=0.5 m and D is 0.9 m above BC, b) h_1=0.1 m and D is 0.2 m below BC? **(06)**

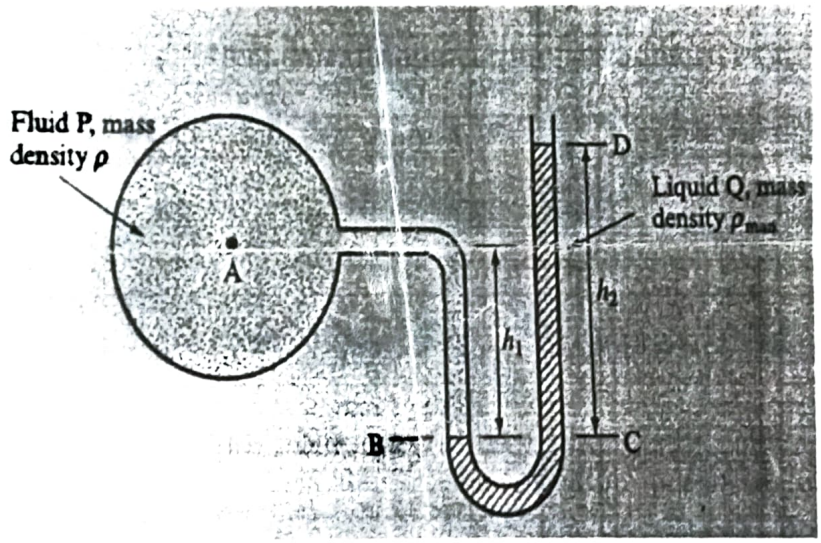

Fig. 1

Q. 4 A rectangular plate 0.6 m wide and 1.2 m deep is submerged in an oil bath of specific gravity 0.8. The maximum and minimum depths of plate are 1.6 m and 0.75 m from the free surface. Calculate the hydrostatic force on one face of the plate, and its depth of centre of pressure. **(06)**

Q. 5 A piston of 10cm diameter and 12.5 cm long slides vertically down in a 10.05 cm diameter cylinder. The oil is filling the annular space has a viscosity of 0.80 poise. Find the speed with which the piston slides down if the load on the piston is 10N. **(06)**