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III SEMESTER B. Tech.

B.Tech.

MID TERM EXAMINATION **Sept-2022**

CE 205 Fluid Mechanics

Time: 1:30 Hours *Max. Marks: 30*

Note : All questions are compulsory.
All questions carry equal marks.
Assume suitable missing data, if any.

Q.1 Find the kinematic viscosity of an oil having density 981 kg/m^3. The shear stress at a point in oil is 0.2452 N/m^2 and velocity gradient at that point is 0.2 per second. ***[6][CO1]***

Q.2 If a liquid weighs 1000 kN and occupies 2.6 m^3 space, find its specific weight, mass density, and specific gravity. **[6][CO1]**

Q.3 A square plane surface 3 m × 3 m lies in water in such a way that its plane makes an angle of 30^0 with the free surface of water. Determine the total pressure and the position of centre of pressure when the upper edge is 1.5 m below the free water surface. **[6][CO2]**

Q.4 A rectangular pontoon is 5 m long, 3 m wide and 1.20 m high. The depth of immersion of the pontoon is 0.08 m in seawater. If the centre of gravity is 0.6 m above the bottom of the pontoon, determine the meta-centric height. The density for seawater = 1025 kg/m^3. **[6][CO2]**

Q.5 A differential manometer connecting two pipelines is shown in the Figure given below. The pressure in pipe A is 120 kN/m^2 and pressure in pipe B is 200 kN/m^2. Find the distance h between the levels of mercury. *[6][CO2]*