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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

B.Tech-IV Semester (Civil)

COURSE CODE: 18B11CE412 MAX. MARKS: 15

COURSE NAME: FLUID MECHANICS

COURSE CREDITS: 3 MAX. TIME: 1 Hour

***Note:*** *All questions are compulsory. Marks are indicated against each question in square brackets.*



Q1. **(a)** Differentiate between Newtonian and Non-Newtonian fluid with suitable example. **[1]**

**(b)** Briefly explain why the viscosity of a liquid decreases while that of a gas increase with a temperature rise. **[1]**

**(c)** Differentiate between U tube manometer and Inverted U tube manometer. At what conditions these two manometers are utilized? **[1]**

**(d)** Find the pressure inside a water droplet having diameter of 0.5 mm at $20^0$ C if the outside pressure is 1.03N/cm$^2$ and the surface tension of water at that temperature is 0.0736 N/m. **[2]**

**(e)** What is the absolute pressure in the sea at a depth of 10 m? Assume the density of seawater is constant at 1025 kg/m$^3$ and that atmospheric pressure is 101325 Pa. **[2]**

Q2. A U tube manometer containing mercury has its right limb open to atmosphere. The left limb is connected to a pipe containing water under pressure, the centre of which is in level with the free surface of mercury. The manometric fluid and water meet in the left limb. Find the pressure of water in the pipe above atmosphere, if the difference of level of mercury in the two limbs is 5 cm. **[4]**

Q3. A hydraulic lift consists of a 50 cm diameter ram and slides in a cylinder of diameter 50.015 cm while the annular space is being filled up with oil having kinematic viscosity of 0.025 cm$^2$/s and specific gravity of 0.85 (shown in Figure). If the rate of travel of the ram is 9.15m/min find the frictional resistance when 3.85 m of ram is engaged in the cylinder. **[4]**