

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- FEB-2023

COURSE CODE(CREDITS): 18B11CE412(3)

MAX. MARKS: 15

COURSE NAME: Fluid mechanics

COURSE INSTRUCTORS: Ashish Kumar

MAX. TIME: 1 Hour

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

Notation has its usual meaning. Assume suitable data if required.

- Q1. How does pressure vary along the depth of fluid ? What would be gauge pressure and absolute pressure of water at a depth of 10 m below the surface? [CO1] [1.5]
- Q2. (a) Explain Newton's Law of viscosity. Explain the importance of viscosity in Fluid mechanics. [CO1] [1.5]
- (b) Find the Dynamic viscosity of the oil, which is used for lubrication between a square plate of size 0.8 m x 0.8 m. The plate is resting at a plane inclined at 30° from horizontal. The thickness of oil film between the plate and the inclined plane is 2 mm. The weight of the square plate is 300 N and it slides down the plane with a uniform velocity of 0.2 m/sec. [CO6] [4]
- Q3. (a) How will you calculate the centre of pressure for vertically submerged bodies? On what factors centre of pressure depends? [CO1] [1]
- (b) Determine the resultant force and centre of pressure acting on a rectangular steel gate having a length 4 m and width 2 m when its upper edge is horizontal and 2 m below the free water surface. [CO2] [3]
- Q4. As shown in the figure, pipe M contains carbon tetrachloride of specific gravity 1.594 under a pressure of 10.5 N/cm^2 and pipe N contains oil of specific gravity 0.8. If the pressure in the pipe N is 17.1 N/cm^2 and the manometric fluid is mercury, find the difference 'x' between the levels of mercury. [CO2] [4]

