

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
 TEST -1 EXAMINATION- 2018  
 B.Tech III Semester

COURSE CODE: 10B11CE312

MAX. MARKS:15

COURSE NAME: Fluid Mechanics

COURSE CREDITS: 4

MAX. TIME: One Hr

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume suitable data if required*

Q1. Answer the following in brief:

- (a) Differentiate between absolute pressure and gauge pressure. [1]
- (b) Define bulk modulus of elasticity. How it is correlated with compressibility? [1]
- (c) Write the equation for centre of pressure for vertical plane submerged in static mass of fluid. What basic findings you observe from this equation? [1]

Q2. Derive the expression for the force exerted by a static mass of fluid on rectangular plane inclined at an angle with free fluid surface. [3]

Q3. A tape of 0.015 cm thick and 1.0 cm wide is to be drawn through a gap with a clearance of 0.01 cm on each side. A lubricant of dynamic viscosity  $0.021 \text{ Ns/m}^2$  completely fills the gap for a length of 80 cm along the tape. If tape can withstand a maximum tensile force of 7.5 N, calculate the maximum speed with which it can be drawn through the gap. [3]

Q4. Determine the minimum size of a glass tube, which can be used to measure the pressure in water flowing system. The capillary rise in the tube must not exceed 10 mm and surface tension of water air glass interface is  $0.0736 \text{ N/m}$  [2]

Q5. As shown in figure water flows through pipe A and B. The pressure difference of these two points is to be measured by multiple tube manometers. Oil with specific gravity 0.88 is in the upper portion of inverted u-tube and mercury in the bottom of both bends. Determine the pressure difference. [4]

