COURSE CODE: 10B11CE312
COURSE NAME: Fluid Mechanics
COURSE CREDIT: 4

MAX. MARKS: 50

MAX. TIME: 2 HRS

Note: Attempt all questions. Assume suitable data if required. Carrying of mobile phone during examinations will be treated as case of unfair means

Q1. Answer the following in brief.

(a) Define centre of pressure and total pressure for a vertical plane. **[2]**

(b) Differentiate between steady flow and unsteady flow. **[2]**

(c) Differentiate between linear deformation and angular deformation. **[2]**

(d) Bernoulli Theorem for real fluid **[2]**

(e) Principle of impulse momentum equation **[2]**

Q2. Show that if velocity potential function exists, the flow should be irrotational. **[5]**

Q3. If the velocity distribution of a liquid over a plate is given by $u = (3/4).y- y^2$, where u is the velocity in m/s at a distance y m above the plate, determine the shear stress at y =0.15 m .Take dynamic viscosity of the liquid as 8.5×10^{-5} kg-sec/m^2 **[5]**

Q4. If for a two dimensional flow, the velocity potential function is given by $\Phi=4x(3y-4)$, Determine the velocity at the point x (2,3). Determine also the value of stream function at the point x. **[10]**

Q5. Water is flowing through a pipe having diameters 30 cm and 15 cm at the bottom and upper end respectively. The intensity of pressure at the bottom end is 29.43 N/cm^2 and the pressure at the upper end is 14.715 N/cm^2. Determine the difference in datum head if the rate of flow through pipe is 50 lit/sec. **[10]**

Q6. In the following figure, fluid A is water, fluid B is oil of specific gravity 0.85, Z = 0.7 m and y = 1.5 m. Compute pressure difference between m and n. **[10]**