Govt. College of Engineering, Amravati

Class test 2  Max. Mark =15  Time : 1 hour   subject - Fluid Mech.

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*Solve any three questions*

Q.1 a Differentiate between the followings: (2)
i) Rotational flow and irrotational flow
ii) Streamlines and streaklines

b. If stream function for steady flow is given by $\Psi = y^2 - x^2$, determine whether the flow is rotational or irrotational. Find the velocity potential (3)

Q.2 a Distinguish between i)a pathline and a streakline
ii) uniform flow and non- uniform line (2)

b. Water flow through a conical tube fixed vertically with its smaller end upwards. The average velocity at the smaller end is 4.5 m/s and at the larger end 1.5 m/s. Length of the conical tube is 1.5 m. The pressure at the upper end is equivalent to a head of 10 m of water. Neglecting losses, determine the pressure at the lower end of the tube. Also, find the piezometric head at the both the ends (3)

Q.3a Derive Eulers equation of motion along streamline (2)

B Water flows through a 300 mm× 150 mm venturimeter at the rate of 0.065 $m^3/s$ and the differential gauge is deflected 1.2 m. Specific gravity of the manometer liquid is 1.6. Determine the coefficient of discharge of the venturimeter (3)

Q.4 a Explain with sketch the working of Pitot tube (2)

B In a 45° bend a rectangular air duct of 1 $m^2$ cross-sectional area is gradually reduced to 0.5 $m^2$ area. Find the magnitude and direction of force required to hold the duct in position if the velocity of flow at 1 $m^2$ section is 10 m/s, and pressure is 30 $kN/m^2$. Take the specific weight of air as 0.0116 $kN/m^3$ (3)