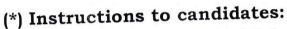G.R. No.

Paper code: P119-121 (T1)

OCTOBER 2019 / INSEM (T1)
F. Y. M. TECH. (Civil-WREE) (SEMESTER - I)
COURSE NAME: Advanced Fluid Mechanics
COURSE CODE: CVPA11181
(PATTERN 2018:R1)

Time: [1 Hour]

[Max. Marks: 20]

(*) Instructions to candidates:
1) Answer Q.1 OR Q.2, Q.3 OR Q.4
2) Figures to the right indicate full marks.
3) Use of scientific calculator is allowed
4) Use suitable data where ever required

Q.1	A source of strength 10 m³/s is located at (-1,0) and a sink of strength 20 m³/s is located at (1,0). Find the velocity and stream function at P (1,1). If the dynamic pressure at infinity is zero for a density of 2 kg/m³ calculate the dynamic pressure at P	10
	OR	
Q.2	Derive continuity equation for 3-D continuity equation in cylindrical and polar coordinate system	10
Q.3	Starting with Navier Stokes equation show that velocity distribution for laminar flow between two infinite parallel fixed plates is parabolic in nature. Determine relation between average velocity and maximum velocity	10
	OR	
Q.4	An oil with density 800 kg/m³ and viscosity 0.16 Ns/m² flows through a 20 cm diameter pipe. The loss of head due to fluid friction over a 100m length of pipe is 1.3 m of oil. Determine a) average velocity of flow b) volumetric flow rate c) wall shear stress d) Darcy's friction factor	10