Total No. of Questions – [4] Total No. of Printed Pages: 1

G.R. No.	

P118-121 (T1)

OCTOBER 2018 / IN - SEM (T1)

F. Y. M. TECH. (CIVIL-WREE) (SEMESTER -I)

COURSE NAME: ADVANCED FLUID MECHANICS

COURSE CODE: CVPA11181

(PATTERN 2018)

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 5 m^2/s located at (-1,0) is combined with a sink of strength 7 m^2/s located at (1,0). Find the stream function and the velocity potential at point (1,2) **10**

OR

Q.2 Derive 3-D continuity equation for steady and incompressible in cylindrical polar system **10**

Q.3 Oil with density 850 kg/m^3 and viscosity 0.16 Ns/m^2 flows through a 20 cm diameter pipe at a rate of 1.2 lit/s. If the length of the pipe is 500 m find the pressure drop between the two ends of the pipe. Also calculate the shear stress at the pipe wall. **10**

OR

Q.4 Consider steady incompressible fully developed laminar flow between two stationary plates 2H apart. The velocity profile is given by $u = u_{max} (Ay^2+By+c)$, where A, B and C are constants and y is measured from the centre of the gap. Develop an expression for volume flow rate per unit depth and evaluate the ratio u_{av}/ u_{max} **10**