Total No. of Questions – [6] Total No. of Printed Pages: 1

G.R. No.	

MARCH 2020 INSEM (T1)
S. Y. B.TECH. (MECHANICAL) (SEMESTER –IV)
COURSE NAME: FLUID MECHANICS AND MACHINES
COURSE CODE: MEUA22183
(PATTERN 2018)

Time: [1 Hour] [Max. Marks: 20]

(*) Instructions to candidates:

1. Attempt Q.1 **OR** Q.2, Q.3 **OR** Q.4, Q.5 **OR** Q.6
2. Figures to the right indicate full marks.
3. Use of scientific calculator is allowed.
4. Assume suitable data wherever required.

Q. 1) Derive an expression for intensity of pressure inside liquid droplet. [4]

A flat plate of 1 m^2 area and a weight of 100 N is sliding down at 60° inclined plane to the vertical over a 1 mm layer of oil whose viscosity is 1 poise. Determine steady state velocity of sliding. [4]

OR

Q. 2) State and Prove and hydrostatic law. [4]

An isosceles triangular plate of base 3 m and altitude 3 m is immersed vertically in an oil of specific gravity 0.85. The base of the plate coincides with the free surface of oil. Determine the total pressure on the plate and position of center of pressure. [4]

Q. 3) Differentiate the following with examples. [4]

a)Steady and unsteady flow b) Uniform and non-uniform flow

A horizontal venturimetr with inlet diameter 20 cm and throat diameter 10 cm is used to measure the flow of oil of specific gravity of 0.8. The discharge of oil through venturimeter is 60 lps. Find the reading of the oil – mercury differential manometer. Take Cd = 0.98. [4]

OR

Q. 4) Explain with neat sketch Pitot tube and also derive an expression of velocity for it. [4]

The velocity potential function is given by $\emptyset = 5 (x^2 - y^2)$. Calculate the velocity components at the point (4,5) [4]

Q. 5) List the minor losses with mathematical equations. [4]

OR

Q. 6) Derive an expression for Euler's number and Froude's number [4]