Q.P. Code: 19CE0109 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations February-2022

FLUID MECHANICS

(Civil Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Define the physical properties of fluids.	L1	6M
	b	A simple U-tube manometer containing mercury in which a fluid of sp. Gravity 0.8 and having vacuum pressure. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe. If the mercury level in the limb is 40 cm and height of fluid in the left from the center of pipe is 15 cm below	L2	6M

OR

2	a	Define about total pressure and center of pressure	L1	4M
	b	A rectangular plane surface is 2m wide and 3m deep it lies in vertical plane in water. Determine the total pressure and position of centre of pressure on the plane surface when its appear edge is horizontal and: (i) Coincides with water surface (ii) 2.5 m below the free surface.	L2	8M

UNIT-II

3		Derive Continuity Equation in 3-Dimensional flow.	L2	12M

OR

4		The velocity vector in a fluid flow is given as $V = 4x^2 i - 10x^2 y + 2tK$. Find the velocity and acceleration of fluid particles at (2 , 1 , 3) at time t = 1	L2	12M

UNIT-III

5		A pipe line carrying oil of specific gravity of 0.87, changes in diameter from 200m diameter at a position A to 500mm diameter at a position B which is 4m at a higher level. If the pressure at A&B are 9.81 N/cm^2 and 5.886 N/cm^2 respectively and the discharge is 200 lit/ sec. Determine the loss of head and the direction of flow.	L2	12M

OR

6		Derive the expression of discharge over a Rectangular notch or Weir.	L2	12M

UNIT-IV

7	A horizontal pipe line 40m long is connected to the water tank at one end and discharges freely into the atmosphere at the other end. For the first 25 m of its length from the tank pipe is 150mm and its dia is suddenly enlarged to 300mm. the height of water level in the tank is 8m above the center of pipe considering all losses of head which cover occur. Determine the rate of flow. Take f = 0.01, for both sections of the pipe?	L2	12M

OR

8	The rate of flow water through a horizontal pipe of 0. 25m m3 /s. The dia of the pipe which is 200mm is suddenly enlarged to 400mm. the pressure intensity in the smaller pipe is 11.772 N/cm^2 . Determine i) Loss of head due to sudden enlargement ii) Pressure intensity in the large pipe iii) power lost due to enlargement	L1	12M

UNIT-V

9	**a**	What is dimensionless number? List the different types of numbers	L1	6M
	b	Explain in detail about reylond's experiment.	L1	6M

OR

10		Derive the Hagen poiseuille equation.	L2	12M

*** END ***