MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

MLRS

II B.Tech I Sem Supplementary Examination, July-2022
Fluid Mechanics
(CIVIL)

Time: 3 Hours.   **Max. Marks: 70**

Note: 1. Answer any FIVE questions.
2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	Classify the various types of fluids with the help of a diagram and briefly explain them.	7M	CO1	BL2
	b)	A body of dimensions 1.5m x 1.0m x 2m weighs 1962 N in water. Find its weight in air. What will be its specific gravity?	7M	CO1	BL1
2		A circular plate of 4.5m diameter is submerged in water with its greatest and least depths below the water surface being 3m and 1.5m respectively. Determine i) the total pressure on the front face of the plate and ii) the position of center of pressure.	14M	CO1	BL5
3	a)	List out the assumptions made while deriving Euler's equation of motion.	7M	CO2	BL4
	b)	i) Define stream function and mention its properties. ii) What is equipotential line?	7M	CO2	BL1
4		A 10m long water pipe is laid at a slope of 3 in 4. The diameters of the lower end and upper end are 120mm and 180mm respectively pressure gauges fixed at the lower end and upper end reads 0.2MPa and 0.3MPa respectively. Determine the flow rate of water through the pipe.	14M	CO2	BL5
5	a)	Explain different types of pitot tubes.	7M	CO3	BL2
	b)	Define potential head, velocity head, and datum head.	7M	CO3	BL1
6		A rectangular notch of width 1.4 m is fitted in the side of a tank of area 8 m². Calculate the time required to lower the water level from 8 m to 3 m. The coefficient of discharge is 0.2	14M	CO3	BL5
7	a)	What are the assumptions made in derivation of Bernoulli's equation?	7M	CO4	BL1
	b)	Water is supplied to a town having a population of 1 lakh from a reservoir 6km away from the town and is stipulated that half of the daily supply of 180 liters per head should be delivered in 8 hrs. What should be the diameter of the supply pipe? The loss of head due to friction in the pipe line is 12m. Take f= 0.002.	7M	CO4	BL1
8		A plate of 800 mm length and 500 mm wide is immersed in a fluid of specific gravity 0.92 and kinematic viscosity $v=10^{-4}$ m²/s. The fluid is moving with a velocity of 8 m/s. Determine boundary layer thickness, shear stress at the end of the plate and drags force one side of the plate.	14M	CO5	BL5

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