SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Regular & Supplementary Examinations December-2023
FLUID MECHANICS & HYDRAULIC MACHINERY
(Mechanical Engineering)

Time: 3 Hours   **Max. Marks: 60**

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

UNIT-I

1	a	Calculate the density, specific weight and weight of one litre of a petrol of specific gravity is 0.7.	CO1	L3	6M
	b	Explain the phenomenon of capillarity. Obtain an expression for capillary fall of a liquid.	CO1	L2	6M

OR

2		Derive the expression for pressure difference in U-tube differential manometer and Inverted U-tube differential manometer with neat sketches.	CO1	L3	12M

UNIT-II

3		Water flows through a pipe AB 1.2 m diameter at 3 m/s and then passes through a pipe BC 1.5 m diameter. At C, the pipe branches. Branch CD is 0.8 m in diameter and carries one third of the flow in AB. The flow velocity in branch CE is 2.5 m/s. Find the volume rate of flow in AB, the velocity in BC, the velocity in CD and the diameter of CE.	CO2	L3	12M

OR

4	a	Derive equation for force exerted by the flowing fluid on a Pipe bend.	CO2	L3	6M
	b	Obtain Euler's equation of motion.	CO2	L3	6M

UNIT-III

5		Explain about Venturimeter with neat sketches. Derive expression for rate of flow through Venturimeter.	CO3	L2	12M

OR

6		List out minor losses in pipe flow and write the equations for all minor losses.	CO3	L1	12M

UNIT-IV

7		Derive an expression for the hydraulic efficiency when a liquid jet strikes an unsymmetrical moving curved plate when jet strikes tangentially at one of the tip.	CO4	L3	12M

OR

8		Explain the various elements of hydroelectric power station with a neat sketch.	CO4	L2	12M

UNIT-V

9		A Pelton wheel is to be designed for the following specifications: Shaft power = 11,772 kW, head = 380 m, speed =750 r.p.m, overall efficiency = 86%. Jet diameter is not to exceed one-sixth of the wheel diameter. Determine: (i) The wheel diameter, (ii) The number of jets required and (iii) Diameter of jet.Take Kv1 = 0.985 and K u1 = 0.45.	CO5	L3	12M

OR

10	a	A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 r.p.m. The vanes of curved back to an angle of 30° with the periphery. The impeller diameter is 300mm and outlet width is 50mm. Determine the discharge of the pump if manometric efficiency is 95%.	CO5	L2	7M
	b	Describe pumps in series and parallel.	CO5	L2	5M

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