Q.P. Code: 20CE0111 **R20**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year II Semester Regular Examinations October-2022

HYDRAULIC ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1		The discharge of water through a rectangular channel of width 8 m is 15 m^3/sec. When the depth of flow of water is 1.2 m. Calculate: (i) specific energy of the flowing water (ii) critical depth and critical velocity (iii) value of minimum specific energy.	L1	12M

OR

2	a	Write a brief note on channel transition with reduction in width of a rectangular channel with neat sketch.	L1	6M
	b	Write a brief note on channel transition with raise in bottom in a rectangular channel with neat sketch.	L1	6M

UNIT-II

3		Derive dynamic equation for GVF in wide rectangular channel.	L2	12M

OR

4	a	Derive an expression for depth of hydraulic jump in terms of upstream Froude number.	L2	6M
	b	Find the rate of change of depth of water in a rectangular channel of 10m wide and 1.5m deep, when the water is flowing with a velocity of 1 m/s. The flow of water through the channel of bed slope 1 in 4000, is regulated in such a way that energy line is having a slope of 0.00004.	L3	6M

UNIT-III

5		Derive the expression for force exerted by a jet on stationary curved plate if jet strikes the curved plate at the Centre and at one end.	L2	12M

OR

6		A jet of water of diameter 50mm strikes a fixed plate in such a way that the angle between the plate and the jet is 30°. The force exerted in the direction of jet is 1417.5 N. Determine the rate if flow of water.	L3	12M

UNIT-IV

7		A centrifugal pump is to discharge 0.118m^3/sec at a speed of 1450r.p.m. against a head of 25m. The impeller diameter is250mm, its width at outlet is 50mm and manometric efficiency is 75%. Determine the vane angle at the outer periphery of the impeller.	L3	12M

OR

8	a	What are different types of dimensionless numbers? Explain them.	L1	6M
	b	Define the terms: model, prototype, hydraulic similitude.	L1	6M

UNIT-V

9	a	What is a turbine and give the classification in detail? Give the various efficiencies.	L1	6M
	b	Explain Radial flow reaction turbine with a neat diagram.	L2	6M
		OR		
10		A jet strikes the buckets of Pelton wheel, which is having shaft power as 15450 kW. The diameter of each jet is given as 200mm.If the net head on the turbine is400 m. Find the overall efficiency of the turbine, take C_v=1.0.	L3	12M

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