Q.P. Code: 18CE0114 **R18**

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

SIDDHARTII INSTITUTE OF ENGINEERING & TECIINOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-2021

HYDRAULIC ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	a	What do you understand by uniform flow and non-uniform flow in the case of Channels.	**2M**
	b	Define hydraulic jump.	**2M**
	c	Define overall efficiency of turbine.	**2M**
	d	What is meant by dimensional homogeneity?	**2M**
	e	What is the purpose of draft tube in the turbine?	**2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	Derive an expression for maximum velocity of flow through a circular section.	**5M**
	b	Determine the expression for the most economical trapezoidal section in terms of side slope.	**5M**

OR

3	a	Derive an expression for discharge through the open channel flow by chezy's constant	**5M**
	b	Find the discharge though a circular pipe of diameter 3 m , if the depth of water in the pipe is 1m and the pipe is laid at the slope of 1 in 1000 . Take C=70.	**5M**

UNIT-II

4	a	Derive an expression for hydraulic jump in the rectangular channel.	**5M**
	b	What are the applications of hydraulic jump?	**5M**

OR

5	a	A sluice gate discharges water into a horizontal rectangular channel with a velocity of 10 m/s and the depth of flow of 1m. Determine the depth of flow after jump and consequent loss in total head.	**5M**
	b	Derive an expression for loss of energy due to hydraulic jump.	**5M**

UNIT-III

6	a	Derive the condition for force on the inclined plate moving in the direction of the jet.	**5M**
	b	Derive the condition for force on the flat vertical plate moving in the direction of jet.	**5M**

OR

7		A nozzle of 50 mm diameter delivers a stream of water at 20m/s perpendicular to a plate that moves away from the jet at 5m/s. Find the force on the plate. Also find the work done and the efficiency of the jet.	**10M**

UNIT-IV

8	a	What it is meant by priming?	**5M**
	b	What is cavitation ? What are the effects of cavitation and mention some precautions against cavitation.	**5M**

OR

9	a	Define and explain Reynolds's number , Froude number and Mach number.	**5M**
	b	In 1 in 40 model of a spillway , the velocity and discharge are 2m/s and 2.5 m^3/s. Find the corresponding velocity and discharge in the prototype.	**5M**

UNIT-V

10	**a**	A Pelton wheel is to be designed for a head of 60m when running at 200r.p.m.The pelton wheel develops 95.6475 kW shaft power. The velocity of the buckets = 0.45 times the velocity of the jet, overall efficiency=0.85 and co-efficient of the velocity=0.98.	**5M**
	b	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 is 400m. Find the overall efficiency of the turbine, take C_v=1.0.	**5M**

OR

11	**a**	What is a turbine and give the classification in detail? Give the various efficiencies.	**5M**
	b	Explain Radial flow reaction turbine with a neat diagram.	**5M**

END