Course Code: 1940117 **Roll No:** **MLRS- R19**

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

II B.Tech II Sem Regular End Examination, August 2021

HYDRAULICS AND HYDRAULIC MACHINERY
(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)	Explain the terms: i) Slope of the bed , ii) Hydraulic mean depth and iii) Wetted perimeter	7M	CO1	L4
	b)	Differentiate between: i) Steady and unsteady flow ii) Critical, subcritical and super critical flow in open channel	7M	CO1	L2
2	a)	Find the velocity of flow and rate of flow of water through a rectangular channel of 6 m wide and 3 m deep, when it is running full. The channel is having bed slope as 1 in 2000. Take chezy's constant C = 55.	7M	CO1	L3
	b)	Define the term most economical section of channel. What are the conditions for the rectangular channel of the best section?	7M	CO1	L1
3	a)	What is essential difference between gradually varied flow and rapidly varied flow? Illustrate with neatly drawn sketch.	7M	CO2	L1
	b)	Explain the following terms: i) Specific Energy and ii) Alternate depths	7M	CO2	L4
4	a)	Derive an expression for critical depth and critical velocity.	7M	CO2	L4
	b)	What do you mean by Fundamental units and Derived units? Give examples.	7M	CO3	L1
5	a)	The time period (t) of a pendulum depends upon the length (L) of the pendulum and acceleration due to gravity (g). Derive an expression for the time period.	7M	CO3	L4
	b)	Define the terms: Model, Prototype, Model analysis, Hydraulic similitude.	7M	CO4	L1
6	a)	Draw neat sketches of the Pelton Turbine and Francis Turbine.	7M	CO4	L2
	b)	What do you mean by Gross head, Net head, and Efficiency of turbine? Mention the different types of the efficiency of turbine.	7M	CO4	L1
7	a)	A turbine develops 9000kw when running at 10 r.p.m. The head on the turbine is 30 m. if the head on the turbine is reduced to 18 m, determine the speed and power developed by the turbine.	7M	CO5	L3
	b)	Define a centrifugal pump. Explain the working of a single-stage centrifugal pump with sketches.	7M	CO5	L4
8	a)	The diameter of an impeller of a centrifugal pump at inlet and outlet are 30 cm and 60 cm respectively. Determine the minimum starting speed of the pump if it works against a head of 30 m.	7M	CO6	L3
	b)	Explain the different types of efficiencies of a centrifugal pump.	7M	CO6	L4

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