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 II SEM Supply End Examination, March 2022
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)	Differentiate between: ☐) Uniform flow and non-uniform flow, ☐) laminar and turbulent flow	7M	CO1	BL2
	b)	With the help of neat sketches explain the terms: ☐) Rapidly Varied flow and ☐) Gradually varied flow	7M	CO1	BL4
2	a)	Find the slope of the bed of a rectangular channel of width 5 m when depth of water is 2 m and rate of flow is given as 20 m³/s. Take chezy's constant, C = 50.	7M	CO1	BL3
	b)	Derive the conditions for the best side slopes of the most economical trapezoidal channel.	7M	CO1	BL6
3	a)	Write a note on Hydraulic jump and Length of hydraulic jump.	7M	CO2	BL1
	b)	The depth of flow of water, at a certain section of a rectangular channel of 4 m wide, is 0.5 m. This discharge through the channel is 16 m³/s. If a hydraulic jump takes place on the downstream side, find the depth of flow after jump.	7M	CO2	BL3
4	a)	Explain the terms: afflux and back water curve. Describe the equation length of back water curve.	7M	CO2	BL4
	b)	Find an expression for the drag force on smooth sphere of diameter D, moving with a uniform velocity V in a fluid of density ρ and dynamic viscosity μ.	7M	CO3	BL3
5	a)	What are the methods of dimensional analysis? Describe the Rayleigh's method for dimensional analysis.	7M	CO3	BL2
	b)	What do you mean by repeating variables? How are the repeating variables selected for dimensional analysis?	7M	CO3	BL1
6	a)	Define the terms: speed ratio, flow ratio, and jet ratio.	7M	CO4	BL1
	b)	A turbine develops 500 kW power under a head of 100 meters at 200 r.p.m. What would be its normal speed and output under a head of 81 meters?	7M	CO4	BL3
7	a)	What is draft tube? Explain the types of draft tubes with neat sketches.	7M	CO4	BL4
	b)	Differentiate between the volute casing and vortex casing for the centrifugal pump.	7M	CO5	BL2
8	a)	Define the terms: suction head, delivery head, static head and manometric head.	7M	CO5	BL1
	b)	Find the number of pumps required to take water from a deep well under a total head of 89 m. All the pumps are identical and are running at 800 r.p.m. The specific speed of each pump is given as 25 while the rated capacity of each pump is 0.16 m³/s.	7M	CO5	BL3

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