Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG / PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2026

Fourth Semester

Civil Engineering

UCET24401 / CE3401 - APPLIED HYDRAULICS ENGINEERING

Regulations – 2024 & 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	State the critical flow	L1	1	2
2.	Elucidate about hydraulic mean depth.	L1	1	2
3.	Write down the dynamic equation of gradually varied flow.	L1	2	2
4.	Distinguish between gradually varied flow and rapidly varied flow in open channel	L4	2	2
5.	Give the applications for Hydraulic jump	L3	3	2
6.	Find an expression for loss of energy head for a hydraulic jump	L3	3	2
7.	A jet of water 40mm diameter with a velocity 30 m/strikes a stationary plate at its normal direction. Determine the force exerted by the jet.	L3	4	2
8.	State the impulse momentum equation	L1	4	2
9.	What is meant by priming of pumps?	L2	5	2
10.	Define specific speed of pump	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No		*Questions*	*BLT*	*CO*	*Marks*
11.	a	Calculate the specific energy of 12m^3 /s of water flowing with a velocity of 1.5m/s in a rectangular channel 7.5m wide. Find the depth of water in the channel when the specific energy would be minimum. Identify the value of critical velocity as well as minimum specific energy?	L3	1	16
		Or			
	b	Describe about sub-critical, super-critical, and critical flow with all its parameters	L3	1	16
12.	a	Classify the different surface profiles for the various bottom slope condition of a channels.	L2	2	16
		Or			
	b	What are the assumption made in analysis of Gradually Varied Flow? Derive the dynamic equation of the GVF.	L3	2	16
13.	a	In a rectangular channel of bed width 0.5 m, a hydraulic jump occurs at a point where depth of flow is 0.15 m and Froude's number is 2.5. Calculate The specific energy, The critical depth, The subsequent depths, Loss of head and Energy dissipated.	L3	3	16
		Or			
	b	Write note on following: (a) Types of hydraulic jump (b) Energy dissipation (c) Positive and negative surges	L3	3	16

14.	a	A pelton wheel working under a head of 500m produces 13000kw at 430rpm. If the efficiency of the wheel (turbine) is 85%. Determine discharge of the turbine, diameter of the runner wheel and diameter of the nozzle. Assume suitable data	L4	4	16
		Or			
	b	Discuss about all classifications of Turbines with illustrations and its performance evaluation.	L4	4	16
15.	a	A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40 degrees at outlet. If the outer diameter of the impeller is 500 mm and width at outlet is 50 mm. List the following Vane angle at inlet, Work done by impeller on water per second and Manometric efficiency.	L4	5	16
		Or			
	b	A single acting reciprocating pump, running at 60rpm delivers 0.53m3 of water per minute. The diameter of the piston is 200mm and stroke length 300mm. The suction and delivery heads are4m and 12m respectively. Determine the theoritical discharge, coefficient of discharge, percentage of slip of the pump and power required to run the pump.	L4	5	16

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