Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (NEW) EXAMINATION – SUMMER 2024

Subject Code:3131307 Date:06-07-2024

Subject Name: Basics of Environmental Hydraulics

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Define (i) Mass Density (ii) Kinematic Viscosity (iii) Specific Gravity.	**03**
	(b)	Distinguish dynamic viscosity and kinematic viscosity. State their unit.	**04**
	(c)	Define the term Capillarity and derive the expression for height of capillary rise for a liquid. $h=4\sigma\cos\theta/\rho gd$.	**07**
Q.2	**(a)**	List the Application of Bernoulli's theorem.	**03**
	(b)	Explain the differential manometer with Sketch.	**04**
	(c)	Derive an expression for the discharge through an Orificemeter.	**07**
		OR	
	(c)	State and prove the Pascal's law.	**07**
Q.3	**(a)**	Explain Pitot tube in details.	**03**
	(b)	State the difference between venturimeter and Orificemeter.	**04**
	(c)	List the minor losses and derive formula for calculating loss of head due to sudden Enlargement.	**07**
		OR	
Q.3	**(a)**	Define HGL and TEL	**03**
	(b)	State the various losses of energy when fluid flows through pipe.	**04**
	(c)	Derive Darcy-Weisbach formula for calculating loss of head due to friction in pipe.	**07**
Q.4	**(a)**	Define Co-efficient of Discharge and Co-efficient of Velocity.	**03**
	(b)	Explain vena-contracta and how does it occur?	**04**
	(c)	Derive an expression for time of emptying a tank through an orifice of circular horizontal tank.	**07**
		OR	
Q.4	**(a)**	Give detail Classification of Mouthpiece.	**03**
	(b)	Derive an expression for loss of head due to sudden contraction	**04**
	(c)	Derive an expression for time of emptying a tank through an orifice of rectangular tank.	**07**
Q.5	**(a)**	Classification of flow in channels.	**03**
	(b)	Write short note on flow through Pipes in Parallel.	**04**
	(c)	Derive an expression for the discharge over a Triangular notch or weir.	**07**
		OR	
Q.5	**(a)**	Give the advantages of triangular notch over a rectangular notch.	**03**
	(b)	Distinguish between Notches and Weirs.	**04**
	(c)	What do you mean by "Most economical section" of an open channel? How it is determined?	**07**

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