Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER– IV EXAMINATION – SUMMER 2026

Subject Code:3140110 Date:19-05-2026

Subject Name: Fluid Mechanics

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: Fluid, Specific gravity, Specific volume	**03**
	(b)	Justify the use of energy correction factors and momentum correction factors in piped and open channel flow analysis.	**04**
	(c)	Explain the Reynold's experiment and its importance in detail for a fluid flowing through the pipe.	**07**
Q.2	**(a)**	Define Buoyancy and Centre of Buoyancy	**03**
	(b)	Write short note on Pitot Tube.	**04**
	(c)	Derive Euler's equation of motion for flow along a stream line. Obtain Bernoulli's from it.	**07**
		OR	
	(c)	Derive expression of potential function and stream function for source flow.	**07**
Q.3	**(a)**	Define Source, Sink and Doublet.	**03**
	(b)	What is the difference between U-tube differential manometers and inverted U-tube differential manometer? Where are they used?	**04**
	(c)	Derive the expression of the co-efficient of friction for viscous flow through a circular pipe.	**07**
		OR	
Q.3	**(a)**	Given velocity field $=5x3\hat{\imath}-15x2y\hat{\jmath}$; obtain the equation of stream line.	**03**
	(b)	Describe the terms atmospheric, absolute, gauge and vacuum pressure with neat sketch.	**04**
	(c)	Write Euler's equation of motion for a steady and incompressible fluid. Derive an expression for Bernoulli's theorem from Euler's equation. Clearly state assumptions made.	**07**
Q.4	**(a)**	Compare rectangular and triangular notches.	**03**
	(b)	States the Pascal's Law and prove it.	**04**
	(c)	Enlist stability criteria of submerged and floating bodies.	**07**
		OR	
Q.4	**(a)**	Classify different types of fluid flow.	**03**
	(b)	Explain the role of computational fluid dynamics in the applications of fluid mechanics.	**04**
	(c)	Derive the Darchy Weishbach equation for turbulent flow.	**07**

Q.5	**(a)**	Differentiate between Steady & Unsteady flow, Uniform & Non-uniform flow and Compressible & Incompressible flow	**03**
	(b)	Write short note on Frames of Reference.	**04**
	(c)	Explain two methods of dimensional analysis.	**07**

OR

Q.5	**(a)**	What is meant by Geometric, Kinematic and Dynamic similarities?	**03**
	(b)	What do you understand by fundamental units and derived units? Illustrate with example.	**04**
	(c)	State Hydrostatic law. Derive equation for variation of pressure vertically for a fluid under the gravity.	**07**

****