EAST POINT COLLEGE OF ENGINEERING & TECHNOLOGY
An Autonomous Institution Affiliated to Visvesvaraya Technological University (VTU) Belagavi

USN | | | | | | | | | | |

24ME43

Fourth Semester B.E. Degree Examination, May 2026
FLUID MECHANICS

TIME:3 hrs. Max.Marks:100

Note: 1. Answer **any FIVE** full questions, choosing **ONE** question from **each MODULE.**
2. M: Marks, L: Bloom's level,C: Course outcomes.
3. Assume missing data suitably.

		Module-1	M	L	C
Q.1	**a**	Explain the types of fluids in detail.	**10**	**L1**	**CO1**
	b	Viscosity and its types. State Newton's law of viscosity.	**10**	**L2**	**CO2**
		OR			
Q.2	**a**	Write the short notes on surface tension, capillarity, and vapour pressure.	**10**	**L2**	**CO3**
	b	Define compressibility and bulk modulus. Derive their relation.	**10**	**L2**	**CO1**
		Module–2			
Q.3	**a**	How buoyancy ca be defined and derive expression for buoyant force.	**10**	**L2**	**CO3**
	b	Explain meta centre and meta centric height. Derive expression for BM.	**10**	**L2**	**CO2**
		OR			
Q.4	**a**	In a fluid the velocity field is given by $V = (3x + 2y)i + (2z+3x^2) j + (2t-3z) k$, Determine : The velocity components u, v, w at any point in the flow field The speed at point (1, 1,1), The speed at time t = 2S at point (0, 0, 2). Also classify the velocity field as steady, or unsteady, uniform or non - uniform one, two or three dimensional.	**10**	**L3**	**CO4**
	b	Explain velocity potential and stream function. Derive Laplace equation.	**10**	**L2**	**CO3**
		Module–3			
Q.5	**a**	Distinguish between Laminar and Turbulent Flow.	**10**	**L1**	**CO2**
	b	State and derive Poiseuille's equation.	**10**	**L2**	**CO4**
		OR			
Q.6	**a**	A 25cm diameter pipe carries oil of specific gravity is 0.9 at a velocity of 3 m/sec. At another section diameter is 20cm. Find the velocity at this section and also mass rate of flow of oil.	**10**	**L3**	**CO4**
	b	Assumptions and limitations of Bernoulli's equation, and its applications	**10**	**L3**	**CO2**
		Module–4			
Q.7	**a**	Briefly explain and draw the Boundary Layer and its development over a flat plate.	**10**	**L2**	**CO3**
	b	Explain the concept of Lift and Drag. How is Lift generated on an Aerofoil?	**10**	**L3**	**CO4**

		OR			
Q.8	**a**	State and explain the Buckingham Pi-Theorem.	**10**	**L3**	**CO3**
	b	Short notes on: Geometric, Kinematic, and Dynamic Similitude.	**10**	**L1**	**CO4**
		Module–5			
Q.9	**a**	Define the Speed of Sound and derive its expression for an ideal gas.	**10**	**L2**	**CO2**
	b	Discuss the effect of Area Change in isentropic flow (Nozzle vs. Diffuser).	**10**	**L1**	**CO2**
		OR			
Q.10	**a**	Explain Stagnation Properties and their importance in compressible flow.	**10**	**L2**	**CO2**
	b	List four major Applications of CFD in modern industry. Briefly explain any two?	**10**	**L2**	**CO3**

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