U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: III**

Branch: Biotechnology **Duration: 3 hrs.**

Course Code: 23BT3PCFME/22BT3PCFME **Max Marks: 100**

Course: Fluid Mechanics

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Discuss the factors to be considered while selecting the repeating variables in Buckingham Π-method of dimensional analysis.	CO2	PO 1	**05**
	b)	Classify the types of fluids with examples and plots.	CO2	PO1	**10**
	c)	Explain the significance of any two dimensionless numbers used in fluid flow phenomena.	CO2	PO1	**05**
		OR			
2	a)	Deduce barometric equation for isothermal condition using the principles of hydrostatic equilibrium.	CO2	PO1	**12**
	b)	Explain the formation of a boundary layer with a neat sketch.	CO2	PO1	**08**
		UNIT - II			
3	a)	Derive Bernoulli's equation for frictionless fluid.	CO2	PO1	**12**
	b)	A non-uniform part of pipeline 5m long is laid at the slope of 2 I n5. The pressure gauges each fitted at the upper and lower ends read 20N/cm^2 and 12.5N/cm^2 respectively. If the diameters at the upper and lower ends are 15cm and 10cm respectively, determine the quantity of water flowing per second.	CO 3	PO 2	**08**
		OR			
4	a)	Deduce Hagen Poiseulle equation for laminar flow of fluids through a circular pipe.	CO2	PO1	**10**
	b)	Derive Ergun's equation. Mention the assumptions made.	CO2	PO1	**10**

			UNIT - III			
	5	a)	Distinguish between variable head and variable area meter.	*CO2*	*PO1*	**06**
		b)	Describe the constructional details and working of an orifice meter with a neat diagram.	*CO2*	*PO1*	**10**
		c)	Write the flow equation for a venturi meter and explain each term.	*CO2*	*PO1*	**04**
			OR			
	6	a)	Describe the construction and working principal of a rotameter with the help of a neat labeled diagram. State its advantages and disadvantages.	*CO2*	*PO1*	**10**
		b)	Explain the characteristic curves of a centrifugal pump.	*CO2*	*PO1*	**10**
			UNIT - IV			
	7	a)	Distinguish between the various types of sedimentation.	*CO2*	*PO1*	**10**
		b)	Classify the process of filtration and explain the significance of Kozeney –Carman equation for filtration.	*CO2*	*PO1*	**10**
			OR			
	8	a)	Explain the working of a Leaf filter with a neat sketch.	*CO2*	*PO1*	**10**
		b)	Explain the types of Fluidization with suitable examples.	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	Explain the types of agitators and different flow patterns with a neat sketch.	*CO2*	*PO1*	**10**
		b)	Describe the construction and working of Banbury mixer with a suitable diagram.	*CO2*	*PO1*	**10**
			OR			
	10	a)	Describe the working of a ribbon blender with a suitable diagram. List its advantages and disadvantages.	*CO2*	*PO1*	**10**
		b)	Elaborate on the significance of power number on power consumption in mixing operation.	*CO2*	*PO1*	**10**

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