

Course Name: **Fluid Flow Operations**, Course Code: **201CHL204**

Day and Date: Monday, 23.01.2023

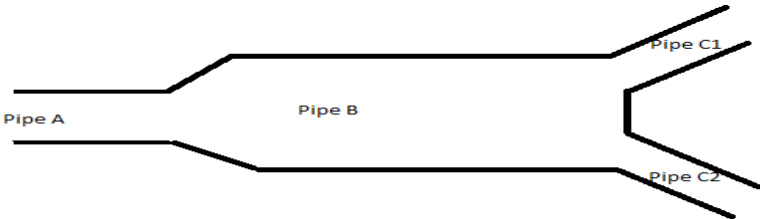
Time: 2.00 pm to 4.00 pm

Seat No:

Max. Marks- 50

Instructions:

- Question No. 1&2 is compulsory.
- Figure to the right indicate full marks.
- Give suitable general Instructions
- Any other Course Specific Instructions.

BT	CO's	Q.No.		Mar ks
		Q.1	All Questions are compulsory	20
2	CO1	a	What is Unit? Explain various unit systems and elaborate Buckingham's Theorem.	6M
2	CO2	b	Derive Bernoulli's theorem without friction along with neat diagram and suitable assumptions.	7 M
3	CO3	c	<p>Water is flowing through the pipe system shown in fig, along with volumetric flow rate $10\text{m}^3/\text{hr}$ through 'A' pipe. An equal quantity of water flows through each of the pipe 'C'.</p>  <p>Calculate, a) Mass flow rate in each pipe b) Average velocity in each pipe c) Mass velocity in each pipe Given data – Inner Diameter of Pipe A = 50 mm Inner Diameter of Pipe B = 75 mm Inner Diameter of Pipe C = 40 mm</p>	7 M
		Q.2	All Questions are compulsory	10
2	CO4	a	<p>Derive an equation to calculate volumetric flow rate by Venturi meter.</p> <p style="text-align: center;">OR</p> <p>Derive an equation to calculate volumetric flow rate by Orifice meter</p>	5
2	CO4	b	Explain the following equations for compressible fluid	5

			i) Total energy balance			
			ii) Mechanical energy balance			
		Q.3	All Questions are compulsory			10
2	CO5	a	Write short notes on Drag coefficient & Shape Factor		Unit: 5	3
2	CO5	b	What is fluidization? Explain various types of fluidization. OR Explain the following equations a) Kozeny-Carman’s equation b) Burke- Plummer equation			7
		Q.4	Attempt any two out of three questions			10
2	CO6	a	Explain flow patterns in agitated vessels and different methods used for prevention of swirling along with neat sketches		Unit: 6	5
2	CO6	b	Elaborate purposes of agitation in details along with neat sketch of agitated vessel.			5
2	CO6	C	Explain various types of impellers used for agitation along with neat sketches.			5
