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PRESIDENCY UNIVERSITY

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Bengaluru

Mid Term Examinations - October 2026

Date: 09/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: PET2114 **Course Name:** Reservoir Fluid Mechanics

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

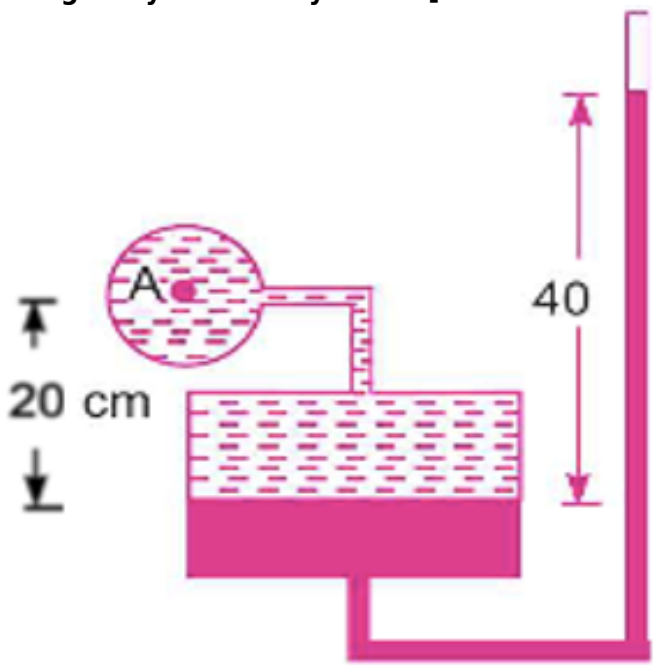
CO - Levels	CO1	CO2
Marks	46	44

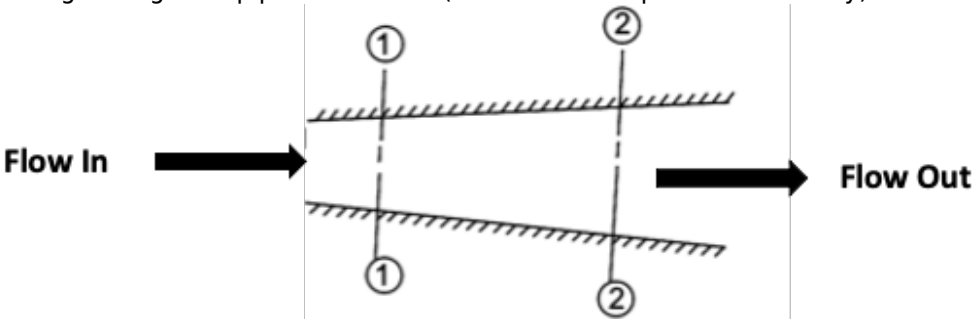
PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Outline Pascal's law and Hydrostatic law along with their mathematical expression.	2	CO1	BT1
2	In a U-tube manometer, mercury is used as the manometric fluid while water is present in the pipe. The main reason for using mercury is its _____. **A)** Low density **B)** Low viscosity **C)** High vapour pressure **D)** High density	2	CO1	BT1
3	According to hydrostatic pressure principles, the pressure in a liquid generally _____. **A)** Decreases with increasing depth **B)** Increases with increasing depth **C)** Remains constant with depth **D)** Becomes zero at greater depth	2	CO1	BT1
4	State the continuity equation for a cartesian system while considering steady and incompressible flow.	2	CO2	BT1
5	Identify the correct answer from the options given below: **A)** Kinematics considers forces, while dynamics ignores forces **B)** Kinematics deals only with pressure, while dynamics deals only with temperature **C)** Both kinematics and dynamics deal only with stationary fluids **D)** Kinematics studies fluid motion, while dynamics considers the forces causing the motion	2	CO2	BT1

PARTB: Answer Any 1 Following Questions. 20 M

Q.N.	Questions	M	CO	BT
06.A	The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of specific gravity 0.8 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. If the difference of mercury levels in the two limbs is 20 cm, estimate the pressure of fluid in the pipe.	10	CO1	BT2
06.B	For a simple U-tube manometer explain that for gauge pressure $P=(\rho_2 gh_2 - \rho_1 gh_1)$ and for vacuum pressure $P=-(\rho_2 gh_2+\rho_1 gh_1)$.	10	CO1	BT2

07.A	A single column manometer is connected to a pipe containing a liquid of specific gravity 0.9. Estimate the pressure in the pipe if the area of the reservoir is 100 times the area of the tube for the manometer reading. **[The specific gravity of mercury is 13.6]** 	10	CO1	BT2
07.B	For a differential U-tube manometer explain the pressure difference (P_A - P_B) while two points, point A and point B are at the same level and contains same liquid of density ρ_1.	10	CO1	BT2

PARTC: Answer Any 1 Following Questions. 20 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
08.A	A 20 cm diameter pipe, conveying water, branches into two pipes of diameters 15cm and 10 cm respectively. If the average velocity in the 20 cm diameter pipe is 2.5 m/s, solve the discharge in this pipe. Also determine the velocity in 10 cm pipe if the average velocity in 15 cm diameter pipe is 2 m/s. **[Draw the image as per question and solve it]**	10	CO2	BT3
08.B	Consider a fluid element is passing through a channel or pipe having area of A_1 and A_2, respectively. At inlet and outlet, the fluid velocity was found to be V_1 and V_2 , respectively (as shown in figure below). Illustrate a relationship while fluid is passing through the pipe or channel. (Consider other parameters if any) 	10	CO2	BT3
09.A	Examine the continuity equation for the cartesian coordination system (three dimension system) and from that equation also demonstrate the equation while considering incompressible and two-dimensional fluid flow.	10	CO2	BT3
09.B	A 35 cm diameter pipe carries oil of specific gravity = 0.9 at a velocity of 4 m/s. At another section, the diameter is 25 cm. Determine the velocity at this section and the mass flow rate of oil.	10	CO2	BT3