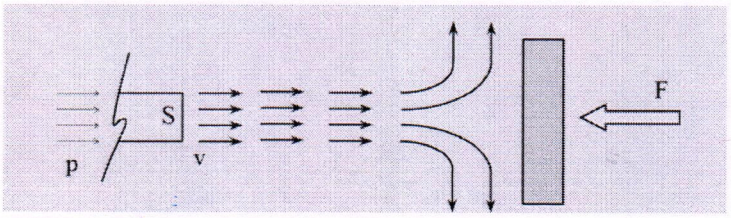
AHMEDABAD UNIVERSITY
School of Engineering and Applied Science
2025-2026 Monsoon

ENR210 Continuum Mechanics
Make-Up Examination
2 Hours

Name:	Roll no.	A	U	2						Marks

/50

Write your answers in the answer book. Attach this sheet to the answer book and then submit it. Answer all questions. Access to the net or notes is not allowed. A scientific calculator is allowed.

		Marks
1.	Define: (a) Mass conservation and derive the mass continuity equation. (b) Define mean stress, mean pressure and hydrostatic stress.	*(5+5=10)*
2.	A flat element has the in-plane stress tensor (MPa) Find the principal stress and direction for each principal stress using the concept of eigen vector and eigen value.	*(2.5*4=10)*
3.	(a) Explain the principle of balance of linear momentum. (b) A water jet with cross-section S, pressure P and velocity v, impacts perpendicularly on a disc as indicated in the figure below. Determine the force "F" in the steady state regime that must be exerted on the disc for it to remain in a fixed position. (Consider the atmospheric pressure in negligible) 	*(5+5=10)*
4.	(a) Define Power and its type. (b) Derive an equation for mechanical power.	*(5+5 =10)*
5.	Derive the mathematical equation for convective flux. Kindly draw diagrams and use proper notation, if required.	*(10)*