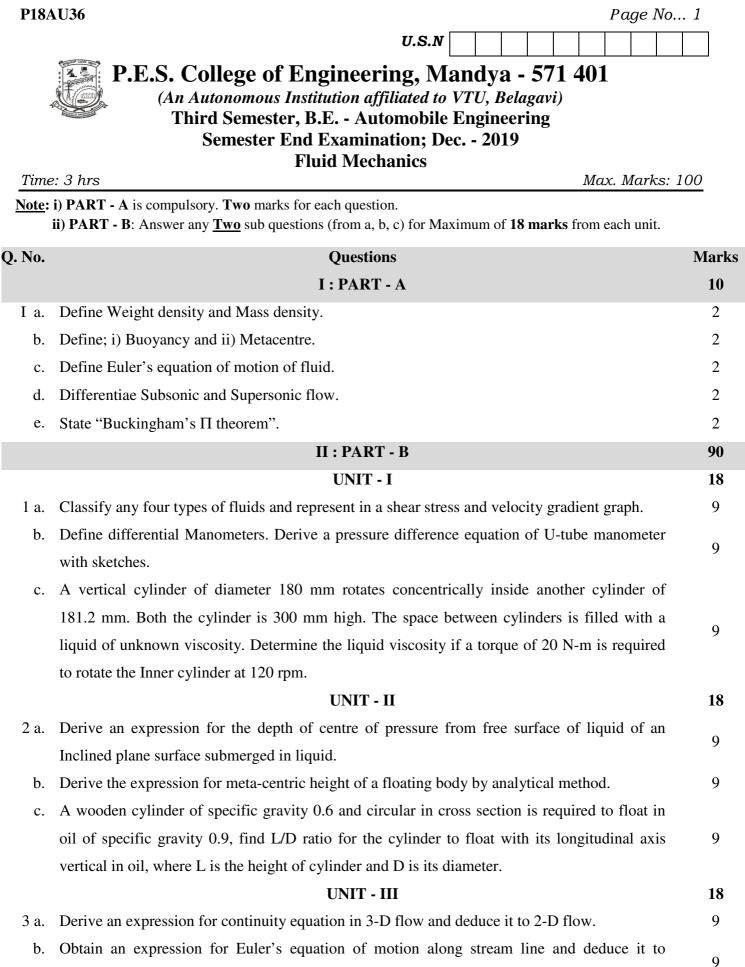
Bernoulli's equation.



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c.	The velocity potential for ϕ is given by, $\phi = \frac{-xy^3}{3} - x^2 + \frac{x^2y}{3} + y^2$. Calculate the velocity	9
	components in x and y directions. Check the possibility of such flow.	

- 4 a. Starting from first principles, show that for Laminar flow between fixed parallel plates the mean velocity is 2/3rd of maximum velocity.
 - b. Show that velocity of sound wave in a compressible fluid medium is given by $C = \sqrt{\frac{K}{\rho}}$ where 9

K and ρ are bulk modulus of elasticity and density of fluid respectively

c. Calculate the velocity and Mach number of a supersonic air craft flying at an altitude of 1200 m when a temperature is 300 K. Sound of air craft is heard 2 second after passage of air
9 craft over the head of an observer. Take; γ = 1.41, R = 287 J/kgK.

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- 5 a. Derive Darcy-Weisbach equation.
 b. Explain different types of similitude.
 c. Assume the viscous force 'F' exerted by a fluid on sphere of diameter D depends on viscosity
 - μ of mass density ρ and velocity of motion 'V' of the sphere. Obtain the expression for shear 9 force 'F', using Buckingham's Π -theorem method.

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