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Q:) The shear stress in a fluid may be expressed as $\tau = \mu\left(\frac{du}{dy}\right)^2$, where μ is the viscosity, du/dy is the velocity gradient and n is a constant. The n-values for Newtonian and non-Newtonian fluids will be respectively

A : n = 1 & n >1

B : n < 1 & n < 1

C : n = 1 & n < 1

D : n = 1 & n = 1

Q:) Match List - I with List - II and select the correct answer using the codes given below the lists:

List - I	List - II
A. Specific weight	1. L / T^2
B. Density	2. F / L^3
C. Elasticity	3. F / L^2
D. Viscosity	4. FT / L^2
	5. FT^2 / L^4

Codes:

A : A-1, B-2, C-3, D-4

B : A-1, B-2, C-3, D-5

C : A-2, B-5, C-3, D-4

D : A-2, B-4, C-3, D-5

Q:) An increase in pressure of 2 bars decrease the volume of liquid by 0.01 percent. The bulk modulus of elasticity of the liquid is

A : $2 \times n/m^2$

B : $2 \times N/m^2$

C : 2×10^9

D : $2 \times 10^{11}\ N/m^2$

Q:) An inclined plate 2 m long and 1 m wide lies with its length inclined at 45^{o} to the surface of water and the nearest edge 1 m below it. If the specific weight of water is 1000 kg/m^3, then the total pressure on the plate (in kg) is approximately.

A : 2000

B : 2500

C : 3000

D : 3420

Q:) Match List - I with List - II and select the correct answer using the codes given below the lists:

List - I	List - II
A. Centimeter	1. Flow rate
B. Current meter	2. Flow velocity
C. Piezometer	3. Flow pressure

Codes:

A : A- 1, B-2, C-3

B : A- 2, B-1, C-3

C : A- 3, B-2, C-1

D : A- 2, B-3, C-1

Q:) Non-colloidal liquids are

A : Newtonian fluids

B : Plastic fluids

C : Ideal fluids

D : Dilatant fluids

Q:) A 3 m wide, 2.5 deep, 10 m long tank, open at the top, has oil standing to 1 m depth. The maximum horizontal acceleration that can be given to the tank without spilling the oil will nearly be

A : 0.10 g

B : 0.20 g

C : 0.25 g

D : 0.31 g

Q:) The velocity components representing the irritating flow is

A : $u = x + y$, $v = 2x-y$

B : $u = 2x + 3y$, $v = -2x^2+ x$

C : $u = x^2$, $v = -2xy$

D : $- 2x$, $v = 2y$

Q:) Given the x-components of the velocity $u = 6xy - 2x^2$, the y - components of the flow v is given by

A : $6y^2$

B : $-6xy + 2x^2$

C : $6x^2 - 2xy$

D : $4xy - 3y^2$

Q:) The velocity vector for a steady three - dimentional flow field is described as:

$$\overrightarrow{V} = yz^2 i + \hat{x}y^2\hat{j}(xy - 2xyz)\hat{k}$$

At point (1,2,3), what is the approximately value of the magnitude of the velocity?

A : 21

B : 18

C : 10

D : 4

Q:) A water jet of an area of 0.03 m^2 impinges normal on a fixed plate. if a force of 1 kN is produced as a result of the impact, the velocity of the jet would be

A : 15 m/s

B : 3.4 m/s

C : 5.78 m/s

D : 33.4 m/s

Q:) In a V-notch, an error of 1% in the measurement of head would constitute in the discharge measurement, an error of

A : 0.01

B : 0.015

C : 0.02

D : 0.025

Q:) The head over a 90^{o} V-notch weir increase from 0.15 m to 0.3 m. The ratio of new discharge to the discharge is, nearly equal to

A : 5.65

B : 1.42

C : 4

D : 2.62

Q:) For laminar flow through a circular tube, the average velocity at a section is

A : The same as that at the centre of tube

B : Two-thirds the velocity at the centre of the tube

C : Half the velocity at the centre of the tube

D : Dependent on the pressure at the section.

Q:) Which one of the following correctly describes the relation between friction factor f of a pipe material and Reynolds numbers R, For $R_e < 100$?

A : $f \propto \sqrt{R_e}$

B : $f \propto \sqrt{\frac{1}{R_e}}$

C : $f \propto \frac{1}{R_e}$

D : $f \propto \log R_e$

Q:) Separation of flow can take place when

A : Flow takes place from zone of higher pressure to lower pressure

B : Flow takes place from zone of lower pressure to higher pressure

C : Pressure gradient has no influence on the flow

D : fluid is non-viscous incompressible and flow condition is isothermal

Q:) The thickness of a laminar boundary layer at a distance 'x' from the leading edge over a flat plate varies are

A : $X^{0.8}$

B : $X^{0.5}$

C : $X^{0.2}$

D : X