

PHYSICS

NEET

CRASH COURSE

**FLUID MECHANICS &
ELASTICITY**

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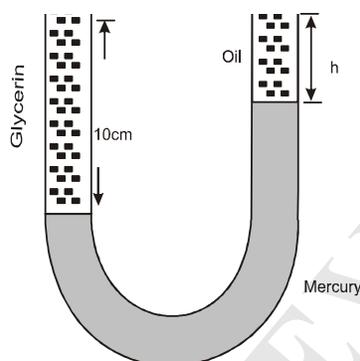
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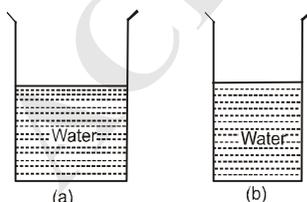
A Unit of SMARTACHIEVERS LEARNING Pvt. Ltd., Delhi

FLUID MECHANICS & ELASTICITY

- Q.1 A vertical U-tube of uniform inner cross section contains mercury in both sides of its arms. A glycerin (density = 1.3 g/cm^3) column of length 10 cm is introduced into one of its arms. Oil of density 0.8 g/cm^3 is poured into the other arm until the upper surfaces of the oil and glycerin are in the same horizontal level. Find the length of the oil column, Density of mercury = 13.6 g/cm^3



- (1) 10.4 cm (2) 8.2 cm (3) 7.2 cm (4) 9.6 cm
- Q.2 From the adjacent figure, the correct observation is



- (1) The pressure on the bottom of tank (a) is greater than at the bottom of (b).
 (2) The pressure on the bottom of the tank (a) is smaller than at the bottom of (b)
 (3) The pressure depend on the shape of the container
 (4) The pressure on the bottom of (a) and (b) is the same
- Q.3 Radius of an air bubble at the bottom of the lake is r and it becomes $2r$ when the air bubbles rises to the top surface of the lake. If P cm water be the atmospheric pressure, then the depth of the lake is
- (1) $2p$ (2) $8p$ (3) $4p$ (4) $7p$
- Q.4 In making an alloy, a substance of specific gravity s_1 and mass m_1 is mixed with another substance of specific gravity s_2 and mass m_2 ; then the specific gravity of the alloy is

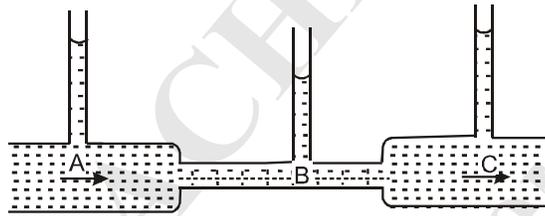
(1) $\left(\frac{m_1 + m_2}{s_1 + s_2}\right)$ (2) $\left(\frac{s_1 s_2}{m_1 + m_2}\right)$ (3) $\left(\frac{m_1 + m_2}{\frac{m_1}{s_1} + \frac{m_2}{s_2}}\right)$ (4) $\left(\frac{\frac{m_1}{s_1} + \frac{m_2}{s_2}}{m_1 + m_2}\right)$

- Q.5 A body is just floating on the surface of a liquid. The density of the body is same as that of the liquid. The body is slightly of pushed down. What will happen to the body
- (1) It will slowly come back to its earlier position (2) It will remain submerged, where it is left
 (3) It will stock (4) It will come out violently

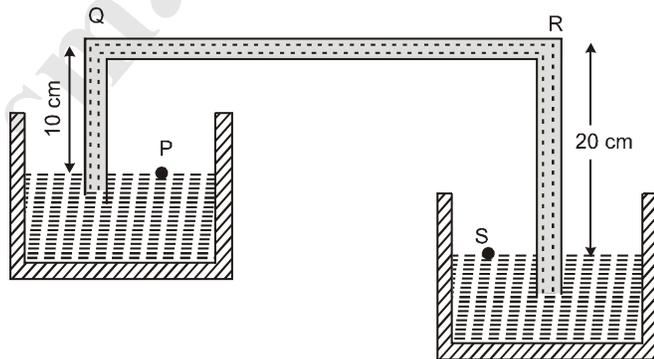
- Q.6 Two water pipes of diameters 2 cm and 4 cm are connected with the main supply line. The velocity of flow of water in the pipe of 2 cm diameter is
- (1) 4 time that in the other pipe (2) $\frac{1}{4}$ time that in the other pipe
- (3) 2 time that in the other pipe (4) $\frac{1}{2}$ time that in the other pipe

- Q.7 Water enters through end A with speed v_1 and leaves through end B with speed v_2 of a cylindrical tube AB. The tube is always completely filled with water. In case I tube is horizontal and in case II it is vertical with end A upwards and in case III it is vertical with end B upwards. We have $v_1 = v_2$ for
- (1) Case I (2) Case II (3) Case III (4) Each case

- Q.8 In the following fig. Is shown the flow of liquid through a horizontal pipe. Three tubes A, B and C are connected to the pipe. The radii of the tubes A, B and c at the junction are respectively 2 cm, 1 cm and 2cm. It can be said that the

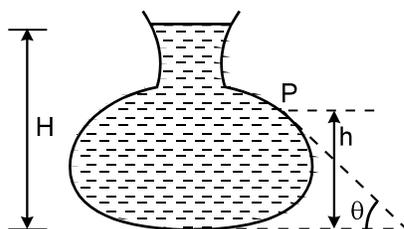


- (1) Height of the liquid in the tube A is maximum
 (2) Height of the liquid in the tubes A and B is the same
 (3) Height of the liquid in all three tubes is the same
 (4) Height of the liquid in the tubes A and C is the same
- Q.9 There is a hole in the bottom of tank having water. If total pressure at bottom is 3 atm ($1 \text{ atm} = 10^5 \text{ N/m}^2$) then the velocity of water flowing from hole is
- (1) $\sqrt{400}$ m/s (2) $\sqrt{600}$ m/s (3) $\sqrt{60}$ m/s (4) None of these
- Q.10 A siphon in use is demonstrated in the following figure. The density of the liquid flowing in siphon is 1.5 gm/cc. The pressure difference between the point P and S will be



- (1) 10^5 N/m (2) $2 \times 10^5 \text{ N/m}$ (3) Zero (4) Infinity

- Q.11 Figure here shown the vertical cross-section of a vessel filled with a liquid of density ρ . The normal thrust per unit area on the walls of the vessel at point P, as shown, will be



- (1) $h\rho g$ (2) $H\rho g$ (3) $(H-h)\rho g$ (4) $(H-h)\rho g \cos\theta$

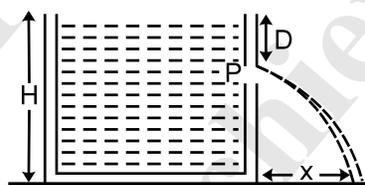
- Q.12 Density of the ice is ρ and that of water is σ . What will be the decrease in volume when a mass M of ice melts.

- (1) $\frac{M}{\sigma - \rho}$ (2) $\frac{\sigma - \rho}{M}$ (3) $M \left[\frac{1}{\rho} - \frac{1}{\sigma} \right]$ (4) $\frac{1}{M} \left[\frac{1}{\rho} - \frac{1}{\sigma} \right]$

- Q.13 A hollow sphere of volume V is floating on water surface with half immersed in it. What should be the minimum volume of water poured inside the sphere so that the sphere now sinks into the water

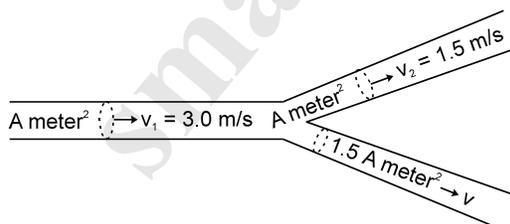
- (1) $V/2$ (2) $V/3$ (3) $V/4$ (4) V

- Q.14 A tank is filled with water up to height H. Water is allowed to come out of a hole P in one of the walls at a depth D below the surface of water. Express the horizontal distance x in terms of H and D :



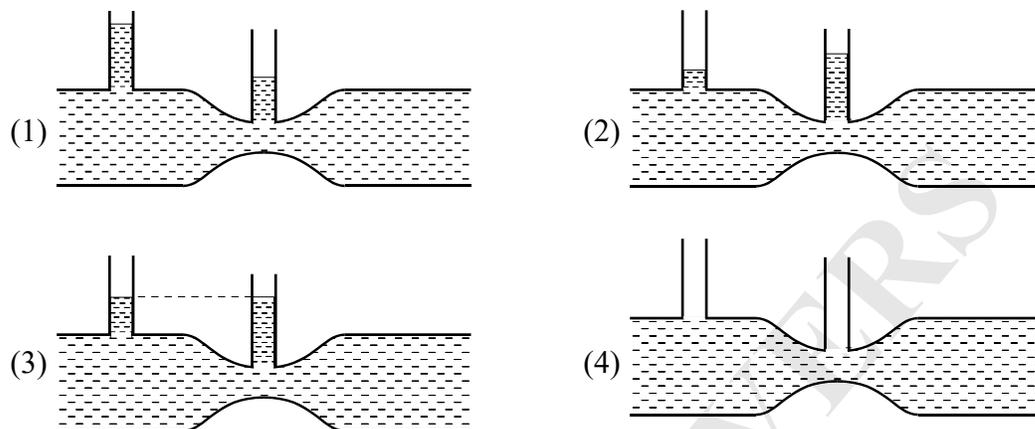
- (1) $x = \sqrt{D(H-D)}$ (2) $x = \sqrt{\frac{D(H-D)}{2}}$ (3) $x = 2\sqrt{D(H-D)}$ (4) $x = 4\sqrt{D(H-D)}$

- Q.15 An incompressible liquid flows through a horizontal tube as shown in the figure. Then the velocity 'v' of the fluid is :

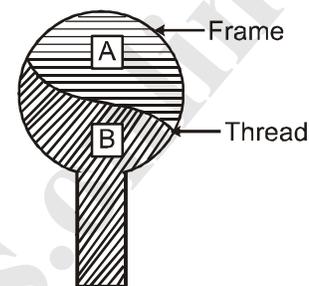


- (1) 3.0 m/s (2) 1.5 m/s (3) 1.0 m/s (4) 2.25 m/s

Q.16 For a fluid which is flowing steadily, the level in the vertical tubes is best represented by



Q.17 A thread is tied slightly loose to a wire frame as shown in the figure. And the frame is dipped into a soap solution and taken out. The frame is completely covered with the film. When the portion A is punctured with a pin, the thread :

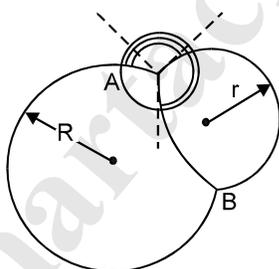


- (1) becomes convex towards A
- (2) becomes concave towards A
- (3) remains in the initial position
- (4) either (1) or (2) depending on size of A w.r.t. B

Q.18 The property of surface tension is to :

- (1) increase the volume
- (2) decrease the volume
- (3) increase the surface area
- (4) decrease the surface area

Q.19 A soap - bubble with a radius 'r' is placed on another bubble with a radius R (figure). Angles between the films at the points of contact will be –



- (1) 120°
- (2) 30°
- (3) 45°
- (4) 90°

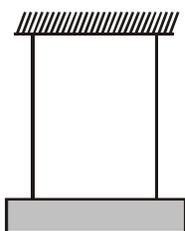
Q.20 A water drop is divided into 8 equal droplets. The pressure difference between the inner and outer side of the big drop will be :

- (1) same as for smaller droplet
- (2) 1/2 of that for smaller droplet
- (3) 1/4 of that for smaller droplet
- (4) twice that for smaller droplet

Q.21 The diameter of a brass rod is 4 mm and Young's modulus of brass is $9 \times 10^{10} \text{ N/m}^2$. The force required to stretch by 0.1% of its length is :

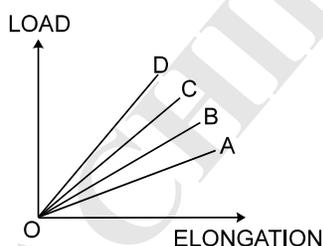
- (1) $360 \pi \text{ N}$
- (2) 36 N
- (3) $144 \pi \times 10^3 \text{ N}$
- (4) $36 \pi \times 10^5 \text{ N}$

- Q.22 Two wires of equal length and cross-section area suspended as shown in figure. Their Young's modulus are Y_1 and Y_2 respectively. The equivalent Young's modulus will be



- (1) $Y_1 + Y_2$ (2) $\frac{Y_1 + Y_2}{2}$ (3) $\frac{Y_1 Y_2}{Y_1 + Y_2}$ (4) $\sqrt{Y_1 Y_2}$

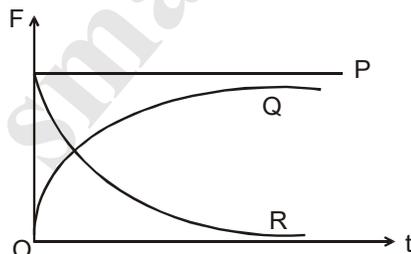
- Q.23 The load versus elongation graph for four wires of the same materials is shown in the figure. The thinnest wire is represented by the line :



- (1) OC (2) OD (3) OA (4) OB
- Q.24 If work done in stretching a wire by 1mm is 2J, the work necessary for stretching another wire of same material, but with double the radius and half the length by 1mm in joule is -
- (1) 1/4 (2) 4 (3) 8 (4) 16

- Q.25 The terminal velocity of a sphere moving through a viscous medium is :
- (1) directly proportional to the radius of the sphere
 (2) inversely proportional to the radius of the sphere
 (3) directly proportional to the square of the radius of sphere
 (4) inversely proportional to the square of the radius of sphere

- Q.26 A spherical ball is dropped in a long column of viscous liquid. Which of the following graphs represent the variation of

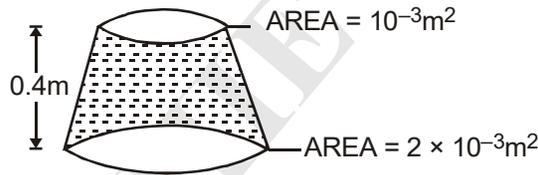


- (i) gravitational force with time
 (ii) viscous force with time
 (iii) net force acting on the ball with time.
- (1) Q, R, P (2) R, Q, P (3) P, Q, R (4) P, R, Q

Q.27 A viscous fluid is flowing through a cylindrical tube. The velocity distribution of the fluid is best represented by the diagram



Q.28 A uniformly tapering vessel shown in Fig. is filled with liquid of density 900 kg/m^3 . The force that acts on the base of the vessel due to liquid is (take $g = 10 \text{ m/s}^2$) -



- (1) 3.6 N (2) 7.2 N (3) 9.0 N (4) 12.6 N

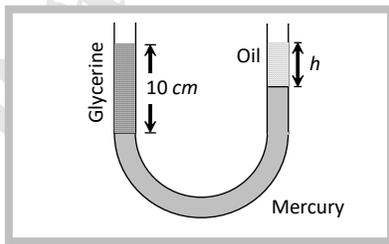
Q.29 Two stretched membranes of areas 2 and 3 m^2 are placed in a liquid at the same depth. The ratio of the pressure on them is -

- (1) 1 : 1 (2) 2 : 3 (3) $\sqrt{2} : \sqrt{3}$ (4) $2^2 : 3^2$

Q.30 Three identical vessels are filled to the same height with three different liquids A, B and C ($\rho_A > \rho_B > \rho_C$). The pressure at the base will be

- (1) Equal in all vessels (2) Maximum in vessel A
(3) Maximum in vessel B (4) Maximum in vessel C

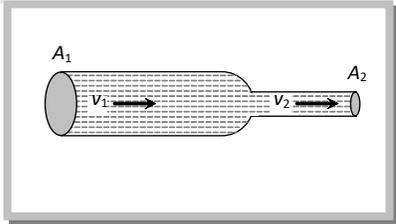
Q.31 A vertical U-tube of uniform inner cross section contains mercury in both sides of its arms. A glycerine (density = 1.3 g/cm^3) column of length 10 cm is introduced into one of its arms. Oil of density 0.8 g/cm^3 is poured into the other arm until the upper surfaces of the oil and glycerine are in the same horizontal level. Find the length of the oil column, Density of mercury = 13.6 g/cm^3



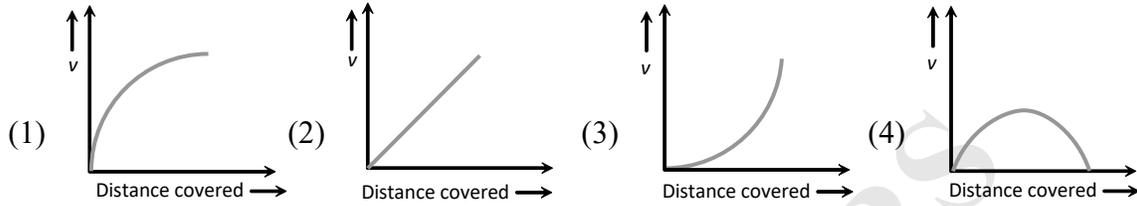
- (1) 10.4 cm (2) 8.2 cm (3) 7.2 cm (4) 9.6 cm

Q.32 Pressure applied to an enclosed fluid is transmitted undiminished to every portion of the fluid and the walls of the containing vessel. This law was first formulated by

- (1) Bernoulli (2) Archimedes (3) Boyle (4) Pascal

- Q.33 If two liquids of same masses but densities ρ_1 and ρ_2 respectively are mixed, then density of mixture is given by
- (1) $\rho = \frac{\rho_1 + \rho_2}{2}$ (2) $\rho = \frac{\rho_1 + \rho_2}{2\rho_1\rho_2}$ (3) $\rho = \frac{2\rho_1\rho_2}{\rho_1 + \rho_2}$ (4) $\rho = \frac{\rho_1\rho_2}{\rho_1 + \rho_2}$
- Q.34 The density of ice is 0.9 g/c.c. and that of sea water is 1.1 g/c.c. An ice berg of volume V is floating in sea water. The fraction of ice berg above water level is -
- (1) 1/11 (2) 2/11 (3) 3/11 (4) 4/11
- Q.35 Water is flowing through a cylindrical pipe of cross-section area $0.09 \pi \text{ m}^2$ at a speed of 1.0 m/s. If the diameter of the pipe is halved, then find the speed of flow of water through it-
- (1) 4.0 m/s (2) 6.0 m/s² (3) 4.0 m/s² (4) 6.0 m/s
- Q.36 Water enters a horizontal pipe of non-uniform cross-section with a velocity of 0.5 m/s and leaves the other end with a velocity of 0.7 m/s. The pressure of water at the first end is 10^3 N/m^2 . Calculate pressure at the other end. (Density of water = $1.0 \times 10^3 \text{ kg/m}^3$)-
- (1) 980 N/m² (2) 880 N/m² (3) 800 N/m (4) None of these
- Q.37 A water tank has a hole in its wall at a distance of 40 m below the free surface of water. Compute the velocity of flow of water from the hole. If the radius of the hole is 1 mm., find the rate of flow of water-
- (1) 26 m/s, $8.8 \times 10^{-5} \text{ m}^3/\text{s}$ (2) 28 m/s, $8.8 \times 10^{-5} \text{ m}^3/\text{s}$
 (3) 28 m/s, $6.8 \times 10^{-5} \text{ m}^3/\text{s}$ (4) 26 m/s, $9.8 \times 10^{-5} \text{ m}^3/\text{s}$
- Q.38 A liquid flows in a tube from left to right as shown in figure. A_1 and A_2 are the cross-sections of the portions of the tube as shown. Then the ratio of speeds v_1/v_2 will be
- (1) A_1/A_2 (2) A_2/A_1
 (3) $\sqrt{A_2}/\sqrt{A_1}$ (4) $\sqrt{A_1}/\sqrt{A_2}$
- 
- Q.39 There is a 1 mm thick layer of oil between a flat plate of area 10^{-2} m^2 and a big plate. How much force is required to move the plate with a velocity of 1.5 cm/s^2 ? The coefficient of viscosity of oil is 1 poise-
- (1) $1.5 \times 10^{-3} \text{ N}$ (2) $1.3 \times 10^{-5} \text{ N}$ (3) $1.5 \times 10^{-2} \text{ N}$ (4) $1.5 \times 10^2 \text{ N}$
- Q.40 The coefficient of viscosity for hot air is
- (1) Greater than the coefficient of viscosity for cold air
 (2) Smaller than the coefficient of viscosity for cold air
 (3) Same as the coefficient of viscosity for cold air
 (4) Increases or decreases depending on the external pressure
- Q.41 The relative velocity of two consecutive layers is 8 cm/s. If the perpendicular distance between the layers is 0.1 cm, then the velocity gradient will be
- (1) 8 sec^{-1} (2) 80 sec^{-1} (3) 0.8 sec^{-1} (4) 0.08 sec^{-1}

Q.42 A lead shot of 1mm diameter falls through a long column of glycerine. The variation of its velocity v with distance covered is represented by



Q.43 A small drop of water falls from rest through a large height h in air; the final velocity is

- (1) $\propto \sqrt{h}$ (2) $\propto h$
 (3) $\propto (1/h)$ (4) Almost independent of h

Q.44 The liquid surfaces have a tendency to contract, this phenomenon is due to-

- (1) surface tension (2) viscosity (3) friction (4) dispersion

Q.45 The surface tension of a liquid depends on -

- (1) contamination (2) impurity dissolved in the liquid
 (3) temperature (4) all the above.

Q.46 The soap and the detergent make water suitable for washing clothes because they-

- (1) make it rich in lather (2) increase its density
 (3) reduce its hardness (4) reduce its surface tension

Q.47 W is the work done in forming a bubble of radius r , the work done in forming a bubble of radius $2r$ will be -

- (1) $4W$ (2) $3W$ (3) $2W$ (4) W

Q.48 The liquid rise in capillary-

- (1) is directly proportional to the thickness of glass
 (2) is inversely proportional to the thickness of glass
 (3) is proportional to the square of the thickness of glass
 (4) does not depend on the thickness of the glass

Q.49 The excess of pressure inside a water drop is P_d and that inside an air bubble of same radius in water is P_b . Which of the following relation is correct ?

- (1) $P_d = P_b$ (2) $2 P_d = P_b$
 (3) $P_d = 2P_b$ (4) none of the above

Q.50 The angle of contact for pure water and clean glass is -

- (1) 0° (2) 90° (3) 180° (4) 360°

Q.51 If a liquid neither rises nor falls in a capillary, its angle of contact is -

- (1) 0° (2) 180° (3) 90° (4) 45°

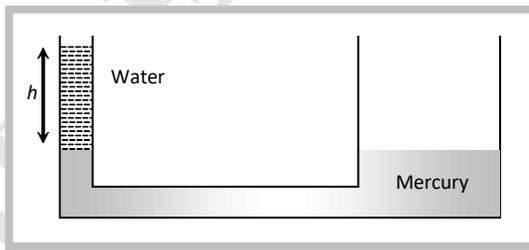
Q.52 The excess pressure inside an air bubble of radius r just below the surface of water is p_1 . The excess pressure inside a drop of the same radius just outside the surface is p_2 . If T is surface tension then -

- (1) $p_1 = 2p_2$ (2) $p_1 = p_2$ (3) $p_2 = 2p_1$ (4) $p_2 = 0, p_1 \neq 0$

Q.53 An air bubble is formed at depth h below the surface of water. The pressure inside the bubble is- ($P_0 =$ atmospheric pressure, $r =$ radius of bubble)

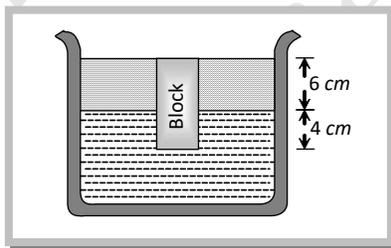
- (1) $\frac{4T}{r}$ (2) $\frac{2T}{r}$ (3) $P_0 + 10^3 hg + \frac{2T}{r}$ (4) $P_0 + 10^3 hg + \frac{4T}{r}$

Q.54 Two communicating vessels contain mercury. The diameter of one vessel is n times larger than the diameter of the other. A column of water of height h is poured into the left vessel. The mercury level will rise in the right-hand vessel ($s =$ relative density of mercury and $\rho =$ density of water) by



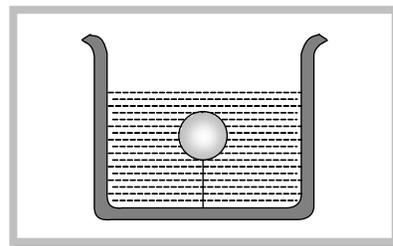
- (1) $\frac{n^2 h}{(n^2 + 1)^2 s}$ (2) $\frac{h}{(n^2 + 1)s}$
 (3) $\frac{h}{(n + 1)^2 s}$ (4) $\frac{h}{n^2 s}$

Q.55 A cubical block of wood 10 cm on a side floats at the interface between oil and water with its lower surface horizontal and 4 cm below the interface. The density of oil is 0.6 gcm^{-3} . The mass of block is



- (1) 706 g (2) 607 g (3) 760 g (4) 670 g

Q.56 A solid sphere of density $\eta (> 1)$ times lighter than water is suspended in a water tank by a string tied to its base as shown in fig. If the mass of the sphere is m then the tension in the string is given by



- (1) $\left(\frac{\eta - 1}{\eta}\right)mg$ (2) ηmg
 (3) $\frac{mg}{\eta - 1}$ (4) $(\eta - 1) mg$

Q.57 Some liquid is filled in a cylindrical vessel of radius R. Let F_1 be the force applied by the liquid on the bottom of the cylinder. Now the same liquid is poured into a vessel of uniform square cross-section of side R. Let F_2 be the force applied by the liquid on the bottom of this new vessel. (Neglect atmospheric pressure) Then:

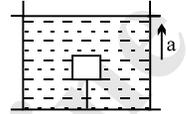
- (1) $F_1 = \pi F_2$ (2) $F_1 = \frac{F_2}{\pi}$ (3) $F_1 = \sqrt{\pi} F_2$ (4) $F_1 = F_2$

Q.58 A cork of density 0.5 gcm^{-3} floats on a calm swimming pool. The fraction of the cork's volume which is under water is

- (1) 0% (2) 25% (3) 10% (4) 50%

Q.59 A body having volume V and density ρ is attached to the bottom of a container as shown. Density of the liquid is $d (> \rho)$. Container has a constant upward acceleration a. Tension in the string is

- (1) $V[Dg - \rho(g+a)]$ (2) $V(g+a)(d - \rho)$ (3) $V(d - \rho)g$ (4) none



Q.60 A steel shot of diameter 2 mm is dropped in a viscous liquid filled in a drum. Find the terminal speed of the shot. Density of the material of the shot = $8.0 \times 10^3 \text{ kg/m}^3$, density of liquid = $1.0 \times 10^3 \text{ kg/m}^3$. Coefficient of viscosity of liquid = 1.0 kg/(m-s) , $g = 10 \text{ m/s}^2$

- (1) 1.55 cm/s (2) 1.455 cm/s (3) 5.1 cm/s (4) None of these

Q.61 If an oil drop of density $0.95 \times 10^3 \text{ kg/m}^3$ and radius 10^{-4} cm is falling in air whose density is 1.3 kg/m^3 and coefficient of viscosity is $18 \times 10^{-6} \text{ kg/(m-s)}$. Calculate the terminal speed of the drop.

- (1) 0.00015 cm/s (2) 0.0005 cm/s (3) 0.0115 cm/s (4) None of these

Q.62 Which of the following is the *incorrect* graph for a sphere falling in a viscous liquid?

(Given at $t = 0$, velocity $v = 0$ and displacement $x = 0$.)



Q.63 There is a 1mm thick layer of glycerine between a flat plate of area 100 cm^2 & a big fixed plate. If the coefficient of viscosity of glycerine is 1.0 kg/m-s then how much force is required to move the plate with a velocity of 7 cm/s ?

- (1) 3.5 N (2) 0.7 N (3) 1.4 N (4) None

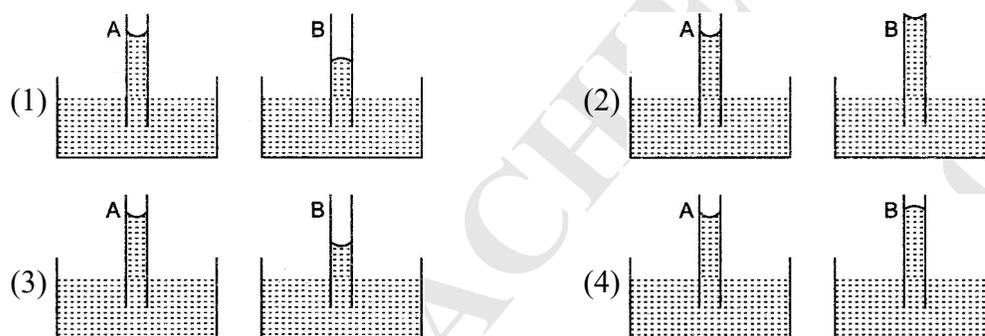
Q.64 A big drop of water whose diameter is 0.2 cm, is broken into 27000 small drops of equal volume. Work done in this process will be - (surface tension of water is $7 \times 10^{-2} \text{ N/m}$).

- (1) $5 \times 10^5 \text{ joule}$ (2) $2.9 \times 10^{-5} \text{ joule}$
 (3) $2.55 \times 10^{-5} \text{ joule}$ (4) zero

Q.65 A soap bubble has radius r. The surface tension of the soap film is T. The energy needed to double the diameter of the bubble without change of temperature is-

- (1) $4 \pi r^2 T$ (2) $2 \pi r^2 T$ (3) $12 \pi r^2 T$ (4) $24 \pi r^2 T$

- Q.66 Suppose that 64 raindrops combine into a single drop. The ratio of the total surface energy of the 64 drops to that of a single drop is- (For water $T = 0.72 \text{ N/m} = 0.072 \text{ Joule/m}^2$.)
 (1) 4 (2) 10 (3) 2 (4) 8
- Q.67 A liquid drop of diameter D is divided into 27 equal droplets. If the surface tension is T then the change in energy will be-
 (1) $3 \pi D^2 T$ (2) $\pi D^2 T$ (3) $2 \pi D^2 T$ (4) $4 \pi D^2 T$
- Q.68 The pressure inside a small air bubble of 0.1 mm radius is -
 $[T = 0.072 \text{ N/m}$ and atmospheric pressure $= 1.013 \times 10^5 \text{ N/m}^2]$.
 (1) $2.027 \times 10^5 \text{ N/m}^2$ (2) $1.013 \times 10^5 \text{ N/m}^2$
 (3) $2 \times .072 \times .001 \text{ N/m}^2$ (4) $1.027 \times 10^5 \text{ N/m}^2$
- Q.69 A capillary tube (A) is dipped in water. Another identical tube (B) is dipped in a soap-water solution. Which of the following shows the relative nature of the liquid columns in the two tubes ?



- Q.70 A ring of radius r and weight W is lying on a liquid surface. If the surface tension of the liquid is T , then the minimum force required to be applied in order to lift the ring up-
 (1) W (2) $2W$ (3) $W + 4\pi rT$ (4) $W + 2\pi rT$
- Q.71 A thin wire ring of radius of 2m is placed on the surface a liquid. If a force of 4N is required to pull this ring from the surface of liquid (before the liquid film breaks) then the surface tension of liquid is
 (1) 4 N/m (2) 2N/m (3) $1/\pi \text{ N/m}$ (4) $1/2\pi \text{ N/m}$

Direction for following questions :

- A. Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.
 B. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 C. Assertion is true but Reason is false.
 D. Assertion and Reason both are false.

Q.72 **Assertion :** A man sitting in a boat which is floating on a pond. If the man drinks some water from the pond, the level of the water in the pond decreases.

Reason : According to Archimede's principle the weight displaced by body is equal to the weight of the body.

- (1) A (2) B (3) C (4) D

Q.73 **Assertion :** The velocity increases, when water flowing in broader pipe enter a narrow pipe.

Reason : According to equation of continuity, product of area and velocity is constant.

- (1) A (2) B (3) C (4) D

Q.74 **Assertion :** Railway tracks are laid on small sized wooden sleepers.

Reason : Small sized wooden sleepers are used so that rails exert more pressure on the railway track. Due to which rail does not leave the track.

- (1) A (2) B (3) C (4) D

Q.75 **Assertion :** The angle of contact of a liquid decrease with increase in temperature.

Reason : With increase in temperature, the surface tension of liquid increase.

- (1) A (2) B (3) C (4) D

Q.76 **Assertion :** The shape of a liquid drop is spherical.

Reason : The pressure inside the drop is greater than that of outside.

- (1) A (2) B (3) C (4) D

ANSWER KEY

Q.1	2	Q.2	4	Q.3	4	Q.4	3	Q.5	2
Q.6	1	Q.7	4	Q.8	4	Q.9	1	Q.10	3
Q.11	3	Q.12	3	Q.13	1	Q.14	3	Q.15	3
Q.16	1	Q.17	2	Q.18	4	Q.19	1	Q.20	2
Q.21	1	Q.22	2	Q.23	3	Q.24	4	Q.25	3
Q.26	3	Q.27	3	Q.28	2	Q.29	1	Q.30	2
Q.31	4	Q.32	4	Q.33	4	Q.34	2	Q.35	1
Q.36	2	Q.37	2	Q.38	2	Q.39	3	Q.40	1
Q.41	2	Q.42	1	Q.43	4	Q.44	1	Q.45	4
Q.46	4	Q.47	1	Q.48	4	Q.49	1	Q.50	1
Q.51	3	Q.52	2	Q.53	3	Q.54	4	Q.55	3
Q.56	1	Q.57	4	Q.58	4	Q.59	2	Q.60	3
Q.61	3	Q.62	3	Q.63	2	Q.64	3	Q.65	4
Q.66	1	Q.67	3	Q.68	3	Q.69	3	Q.70	3
Q.71	4	Q.72	3	Q.73	1	Q.74	4	Q.75	3
Q.76	2								