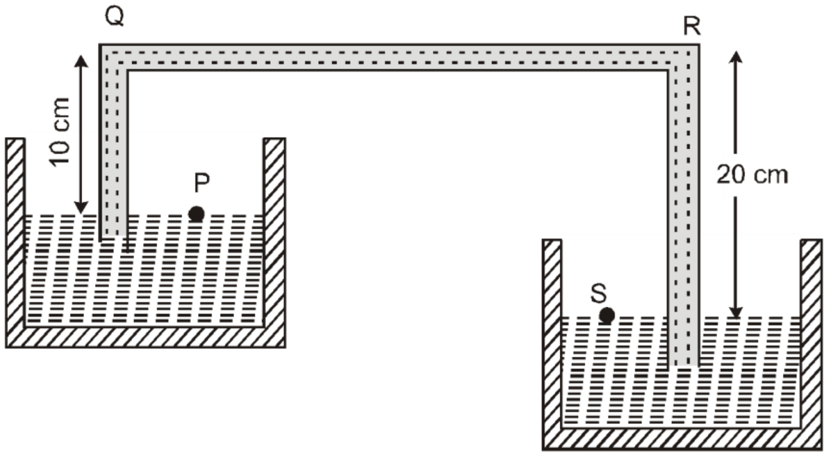
Exercise-1

✍ **Marked Questions can be used as Revision Questions.**

OBJECTIVE QUESTIONS

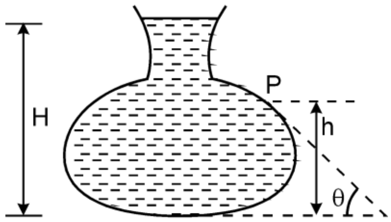
Section (A) : Measurement and calculation of pressure

A-1 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) 2×10^5 N/m (3) Zero (4) Infinity

A-2✍ 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

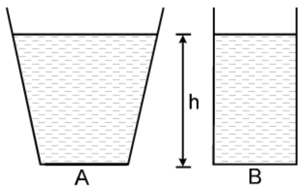


(1) $h \rho g$
(2) $H \rho g$
(3) $(H - h) \rho g$
(4) $(H - h) \rho g \cos\theta$

A-3✍ A tank with length 10 m, breadth 8 m and depth 6m is filled with water to the top. If g = 10 m s^{-2} and density of water is 1000 kg m^{-3}, then the thrust on the bottom is
(1) $6 \times 1000 \times 10 \times 80$ N (2) $3 \times 1000 \times 10 \times 48$ N
(3) $3 \times 1000 \times 10 \times 60$ N (4) $3 \times 1000 \times 10 \times 80$ N

A-4✍ In a hydraulic lift, used at a service station the radius of the large and small piston are in the ratio of 20 : 1. What weight placed on the small piston will be sufficient to lift a car of mass 1500 kg ?
(1) 3.75 kg (2) 37.5 kg (3) 7.5 kg (4) 75 kg.

A-5✍ Two vessels A and B of different shapes have the same base area and are filled with water up to the same height h (see figure). The force exerted by water on the base is F_A for vessel A and F_B for vessel B. The respective weights of the water filled in vessels are W_A and W_B. Then

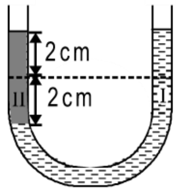


(1) $F_A > F_B$; $W_A > W_B$ (2) $F_A = F_B$; $W_A > W_B$
(3) $F_A = F_B$; $W_A < W_B$ (4) $F_A > F_B$; $W_A = W_B$

A-6 An open tank 10m long and 2m deep is filled up to 1.5 m height of oil of specific gravity 0.82. The tank is uniformly accelerated along its length from rest to a speed of 20 m/sec horizontally. The shortest time in which the speed may be attained without spilling any oil is : [g = 10 m/sec^2]

(1) 20 sec. (2) 18 sec. (3) 10 sec. (4) 5 sec.

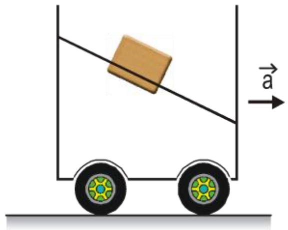
A-7 A U-tube of uniform cross-section as shown in figure is partially filled with a liquid I. Another liquid II which does not mix with liquid I is poured into one side. It is found that the liquid levels of the two sides of the tube are the same, while the level of liquid I has risen by 2 cm. If the specific gravity of liquid I is 1.1, the specific gravity of liquid II must be



(1) 1.12 (2) 1.1

(3) 1.05 (4) 1.0

A-8 An open water tanker moving on a horizontal straight road has a cubical block of cork floating over its surface. If the tanker has an accelecration of a as shown, the acceleration of the cork w.r.t. container is (ignore viscosity) –



(1) Zero (2) $\frac{a^2}{g}$

(3) $\frac{a}{y}\sqrt{g^2-a^2}$ (4) a

Section (B) : Archemedies principle and force of buoyancy

B-1 Two solids A and B float in water. It is observed that A floats with half its volume immersed and B floats with 2/3 of its volume immersed. Compare the densities of A and B

(1) 4 : 3 (2) 2 : 3 (3) 3 : 4 (4) 1 : 3

B-2 The fraction of a floating object of volume V_0 and density d_0 above the surface of a liquid of density d will be

(1) $\frac{d_0}{d}$ (2) $\frac{dd_0}{d+d_0}$ (3) $\frac{d-d_0}{d}$ (4) $\frac{dd_0}{d-d_0}$

B-3 The density of ice is x gm/cc and that of water is y gm/cc. What is the change in volume in cc, when m gm of ice melts ?

(1) M (y – x) (2) (y – x)/m (3) mxy (x – y) (4) m (1/y – 1/x)

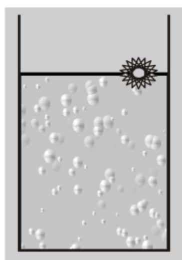
B-4 A cork is completely submerged always in water by a spring attached to the bottom of a bowl. When the bowl is kept in an elevator moving with acceleration downwards, the length of spring

(1) Increases (2) Decreases (3) Remains unchanged (4) None of these

B-5 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

B-6. A body floats in liquid contained in a beaker. If the whole system (shown in fig.) falls under gravity then the up-thrust on the body is-



(1) 2 mg

(2) zero

(3) mg

(4) less than mg

B-7 A body of density ρ is dropped from rest from a height 'h' (from the surface of water) into a lake of density of water σ (σ > ρ). Neglecting all dissipative effects, the acceleration of body while it is in the lake is:

(1) $g\left(\frac{\sigma}{\rho}-1\right)$ upwards (2) $g\left(\frac{\sigma}{\rho}-1\right)$ downwards

(3) $g\left(\frac{\sigma}{\rho}\right)$ upwards (4) $g\left(\frac{\sigma}{\rho}\right)$ downwards

B-8 A cubical block of copper of side 10 cm is floating in a vessel containing mercury. Water is poured into the vessel so that the copper block just gets submerged. The height of water column is (ρ_{Hg} = 13.6 g/cc , ρ_{Cu}= 7.3 g/cc, ρ_{water} =1 gm/cc)

(1) 1.25 cm (2) 2.5 cm (3) 5 cm (4) 7.5 cm

B-9 A block of silver of mass 4 kg hanging from a string is immersed in a liquid of relative density 0.72. If relative density of silver is 10, then tension in the string will be:[take g = 10 m/s^2]

(1) 37.12 N (2) 42 N (3) 73 N (4) 21 N

B-10 A boy carries a fish in one hand and a bucket (not full) of water in the other hand. If he places the fish in the bucket, the weight now carried by him (assume that water does not spill):

(1) is less than before (2) is more than before

(3) is the same as before (4) depends upon his speed

Section (C) : Continuity equation and Bernoulli theorem & their application

C-1 Bernoulli's principle is based on the law of conservation of :

(1) mass (2) momentum (3) energy (4) none of these

C-2 Bernoulli's equation is applicable to points:

(1) in a steadily flowing liquid
(2) in a stream line
(3) in a straight line perpendicular to a stream line
(4) for ideal lequid stream line flow on a stream line

C-3 Bernoulli's equation is based upon:

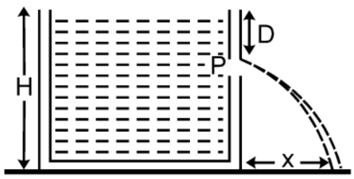
(1) isochoric process (2) isobaric process (3) isothermal process (4) adiabatic process

C-4 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) $\frac{1}{4}$ times that in the other pipe

(3) 2 times that in the other pipe (4) $\frac{1}{2}$ times that in the other pipe

C-5 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 :



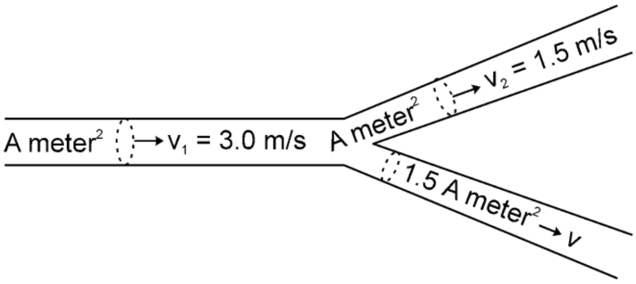
(1) x = $\sqrt{D(H-D)}$ (2) x = $\sqrt{\frac{D(H-D)}{2}}$

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

C-6 A fixed cylindrical vessel is filled with water up to height H. A hole is bored in the wall at a depth h from the free surface of water. For maximum horizontal range h is equal to :

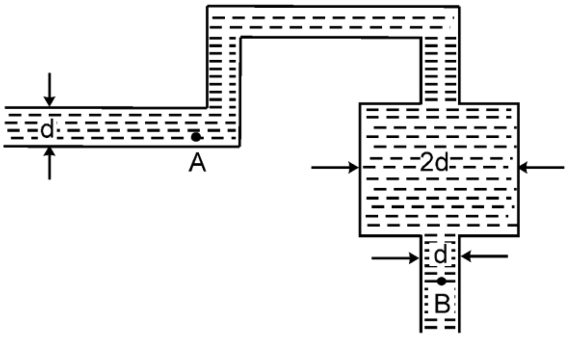
(1) H (2) 3H/4 (3) H/2 (4) H/4

C-7 An incompressible liquid flows through a horizontal tube as shown in the figure. Then the velocity ' v ' of the fluid is :



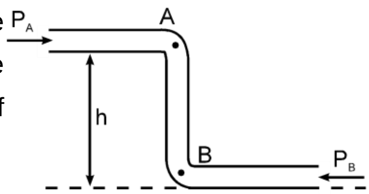
(1) 3.0 m/s (2) 1.5 m/s (3) 1.0 m/s (4) 2.25 m/s

C-8 An ideal fluid is flowing through the given tubes which is placed on a horizontal surface. If the liquid has velocities V_A and V_B, and pressures P_A and P_B at points A and B respectively, then the correct relation is (A and B are at same height from ground level, the figure shown is as if the system is seen from the top) :



(1) $V_A > V_B$, $P_A < P_B$ (2) $V_A < V_B$, $P_A > P_B$ (3) $V_A = V_B$, $P_A = P_B$ (4) $V_A > V_B$, $P_A = P_B$

C-9 Figure shows an ideal fluid flowing through a uniform cross-sectional tube in the vertical tube with liquid velocities v_A & v_B and pressure P_A & P_B. Knowing that tube offers no resistance to fluid flow then which of the following is true.



(1) $P_B > P_A$ (2) $P_B < P_A$

(3) $P_A = P_B$ (4) none of these

Exercise-2

✍ **Marked Questions can be used as Revision Questions.**

PART - I : OBJECTIVE QUESTIONS

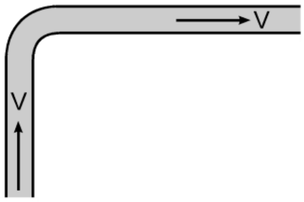
1.✍ A block of volume V and of density σ_b is placed in liquid of density $\sigma_l(\sigma_l > \sigma_b)$, then block is moved upward upto a height h and it is still in liquid. The increase in gravitational potential energy of the system is :

(1) $\sigma_b Vgh$ (2) $(\sigma_b + \sigma_l)Vgh$ (3) $(\sigma_b - \sigma_l)Vgh$ (4) none of these

2.✍ A metallic sphere floats (just sink) in an immiscible mixture of water ($\rho_w = 10^3$ kg/m^3) and a liquid ($\rho_L = 13.5 \times 10^3$) with (1/5)th portion by volume in the liquid. The density of the metal is :

(1) 4.5×10^3 kg/m^3 (2) 4.0×10^3 kg/m^3 (3) 3.5×10^3 kg/m^3 (4) 1.9×10^3 kg/m^3

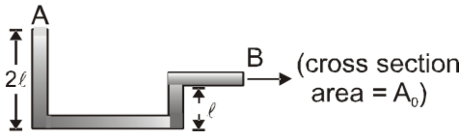
3.✍ A fire hydrant delivers water of density ρ at a volume rate L. The water travels vertically upward through the hydrant and then does 90^0 turn to emerge horizontally at speed V. The pipe and nozzle have uniform cross-section throughout. The force exerted by the water on the corner of the hydrant is



(1) ρVL (2) zero

(3) $2\rho VL$ (4) $\sqrt{2}\rho VL$

4.✍ A tube in vertical plane is shown in figure. It is filled with a liquid of density ρ and its end B is closed. Then the force exerted by the fluid on the tube at end B will be : [Neglect atmospheric pressure and assume the radius of the tube to be negligible in comparison to ℓ]



(1) 0 (2) $\rho g\ell A_0$

(3) $2\rho g\ell A_0$ (4) Cannot be determined

5. A block of iron is kept at the bottom of a bucket full of water at 2°C. The water exerts buoyant force on the block. If the temperature of water is increased by 1°C the temperature of iron block also increases by 1°C. The buoyant force on the block by water

(1) will increase

(2) will decrease

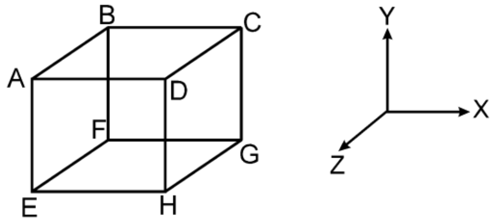
(3) will not change

(4) may decrease or increase depending on the values of their coefficient of expansion

6. The cubical container ABCDEFGH which is completely filled with an ideal (nonviscous and incompressible) fluid, moves in a gravity free space with a acceleration of

$$a = a_0\ (\hat{i} - \hat{j} + \hat{k})$$

where a_0 is a positive constant. Then the only point in the container where pressure is maximum, is



(1) B (2) C (3) E (4) F

7. In previous question pressure will be minimum at point –

(1) A (2) B (3) H (4) F

8. 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) $\frac{1}{M}\left[\frac{1}{\rho} - \frac{1}{\sigma}\right]$

9. The reading of a spring balance when a block is suspended from it in air is 60 newton. This reading is changed to 40 newton when the block is submerged in water. The specific gravity of the block must be therefore :

(1) 3 (2) 2 (3) 6 (4) 3/2

10. A block of steel of size 5 cm × 5 cm × 5 cm is weighed in water. If the relative density of steel is 7. Its apparent weight is :

(1) 6 × 5 × 5 × 5 gf (2) 4 × 4 × 4 × 7 gf (3) 5 × 5 × 5 × 7 gf (4) 4 × 4 × 4 × 6 gf

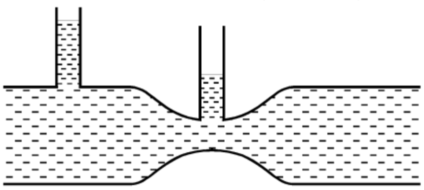
11. Two bodies are in equilibrium when suspended in water from the arms of a balance. The mass of one body is 36 g and its density is 9 g/cc. If the mass of the other is 48 g, its density in g/cc is :

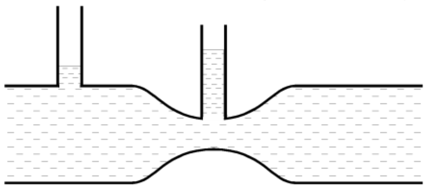
(1) 4/3 (2) 3/2 (3) 3 (4) 5

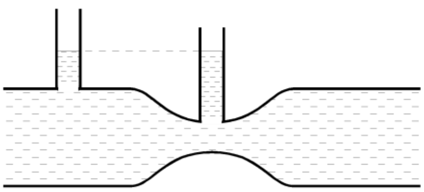
12. In order that a floating object be in a stable rotation at equilibrium, its centre of buoyancy should be

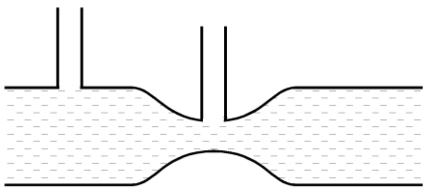
(1) vertically above its centre of gravity (2) vertically below its centre of gravity
(3) horizontally in line with its centre of gravity (4) may be anywhere

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

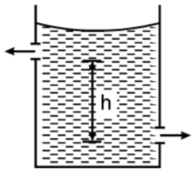
(1) 

(2) 

(3) 

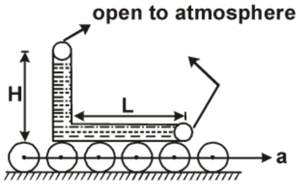
(4) 

14. There are two identical small holes on the opposite sides of a tank containing a liquid. The tank is open at the top. The difference in height between the two holes is h. As the liquid comes out of the two holes, the tank will experience a net horizontal force proportional to:



(1) $h^{1/2}$ (2) h (3) $h^{3/2}$ (4) h^2

15. A narrow tube completely filled with a liquid is lying on a series of cylinders as shown in figure. Assuming no sliding between any surfaces, the value of acceleration of the cylinders for which liquid will not come out of the tube from anywhere is given by



(1) $\frac{gH}{2L}$ (2) $\frac{gH}{L}$

(3) $\frac{2gH}{L}$ (4) $\frac{gH}{\sqrt{2}L}$

PART - II : MISCELLANEOUS QUESTIONS

Section (A) : Assertion/Reasoning

A-1. **STATEMENT-1 :** Any pressure increase at one point of a static connected fluid passed to each point undiminished.

STATEMENT-2 : Fluid is assumed to be incompressible.

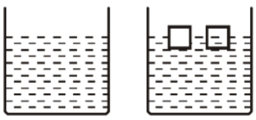
(1) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(2) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(3) Statement-1 is True, Statement-2 is False

(4) Statement-1 is False, Statement-2 is True

A-2. **STATEMENT-1 :** One of the two identical container is empty and the other contains two ice cubes. Now both the containers are filled with water to same level as shown. Then both the containers shall weigh the same.



STATEMENT-2 : The weight of volume of water displaced by ice cube floating in water is equal to the weight of ice cube. Hence both the container in above situation shall weigh the same.

(1) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.

(2) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1

(3) Statement-1 is True, Statement-2 is False

(4) Statement-1 is False, Statement-2 is True

A-3. **STATEMENT-1 :** Consider an object that floats in water but sinks in oil. When the object floats in water, half of it is submerged. If we slowly pour oil on top of water till it completely covers the object, the object moves up.

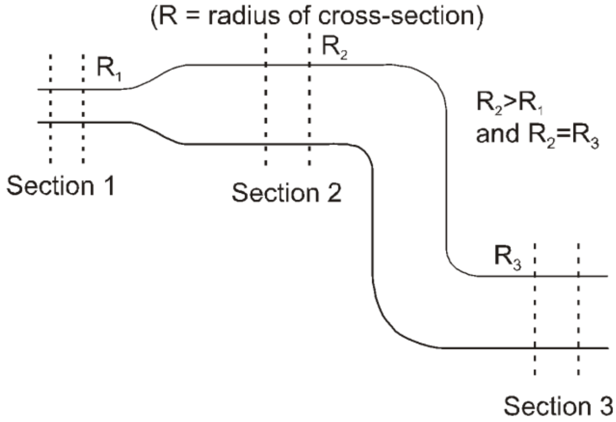
STATEMENT-2 : As the oil is poured in the situation of statement-1, pressure inside the water will increase everywhere resulting in an increase in upward force on the object.

(1) Statement-1 is True, Statement-2 is True; Statement-2 is a correct explanation for Statement-1.
(2) Statement-1 is True, Statement-2 is True; Statement-2 is NOT a correct explanation for Statement-1
(3) Statement-1 is True, Statement-2 is False
(4) Statement-1 is False, Statement-2 is True

Section (B) : Match The Column

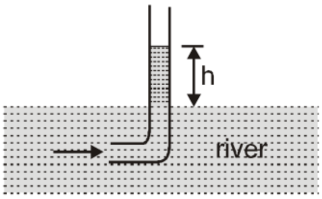
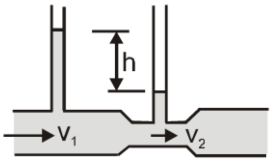
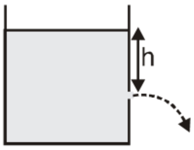
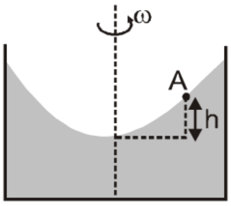
B-1. An arrangement of the pipes of circular cross-section is shown in the figure. The flow of water (incompressible and nonviscous) through the pipes is steady in nature. Three sections of the pipe are marked in which section 1 and section 2 are at same horizontal level, while being at a greater height than section 3. Correctly match order of the different physical parameter with the options given. In column-I certain statements are given and numbers given in column-II represent the section shown in figure. Match the statements in column-I with corresponding ranking in column-II

(R = radius of cross-section)



Column-I	Column-II
(1) Order of volume flow rate in section	(p) 1 > 2 > 3
(2) Order of kinetic energy of a mass element while flowing through sections.	(q) 3 > 2 > 1
(3) Order of pressure in the sections.	(r) 1 > 2 = 3
(4) Order of flow speed in sections	(s) 1 = 2 = 3

B-2. In **Column** I, position of a water level are shown in certain cases and certain things are given and certain quantities are asked.Correctly match the asked quantity with the quantities given in column II.

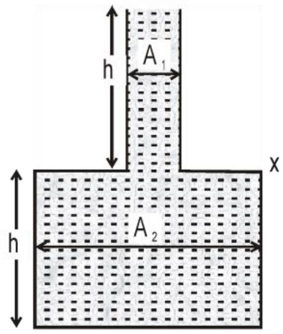
Column–I	**Column–II**
(1)  Pitot tube is used to find the speed v of the flow of the river water. The expression for v^2 is :	(p) $2gh$
(2)  Area of cross section of the narrower part of the venturi tube is 1/2 of that of the wider part. If the velocity in the wider part is v_1 and that in the narrower part is v_2 then v_1^2 is :	(q) $\frac{2gh}{3}$
(3)  If the velocity of the efflux from a wide stationary tank and small orifice is v then v^2 is :	(r) $4gh$
(4)  A cylindrical beaker containing some liquid is rotated with constant angular speed about its axis. If the speed of the point A is v then v^2 is :	(s) $6gh$

Section (C) : One Or More Than One Options Correct

C-1. Pressure gradient in a static fluid is represented by (z–direction is vertically upwards, and x-axis is along horizontal,d is density of fluid) :

(1) $\frac{\partial p}{\partial z} = -dg$ (2) $\frac{\partial p}{\partial x} = dg$ (3) $\frac{\partial p}{\partial x} = 0$ (4) $\frac{\partial p}{\partial z} = 0$

C-2. The vessel shown in Figure has two sections of area of cross-section A_1 and A_2. A liquid of density ρ fills both the sections, up to height h in each. Neglecting atomospheric pressure,



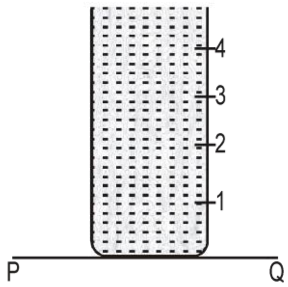
(1) the pressure at the base of the vesel is 2 h ρ g

(2) the weight of the liquid in vessel in equal to 2 h ρ gA_2

(3) the force exerted by the liquid on the base of vessel is 2 h ρ g A_2

(4) the walls of the vessel at the level X exert a force h ρ g (A_2 – A_1) downwards on the liquid.

C-3. A cylindrical vessel of 90 cm height is kept filled upto the brim as shown in the figure. It has four holes 1, 2, 3, 4 which are respectively at heights of 20cm, 30 cm, 40 cm and 50 cm from the horizontal floor PQ. The water falling at the maximum horizontal distance from the vessel comes from



(1) hole number 4

(2) hole number 3

(3) hole number 2

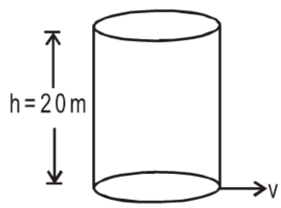
(4) hole number 1

Exercise-3

*** Marked Questions may have more than one correct option.**

PART - I : JEE (MAIN) / AIEEE PROBLEMS (PREVIOUS YEARS)

1. A cylinder of height 20m is completely filled with water. The velocity of efflux of water (in ms^{-1}) through a small hole on the side wall of the cylinder near its bottom, is : **[AIEEE 2002, 4/300]**



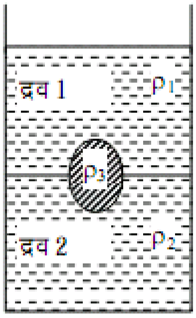
(1) 10 (2) 20

(3) 25.5 (4) 5

2. The bob of a simple pendulum executes simple harmonic motion in water with a period t, while the period of oscillation of the bob is t_0 in air. Neglecting frictional force of water and given that the density of the bob is (4/3) × 1000 kg/m^3. What relationship between t and t_0 is true? **[AIEEE 2004]**

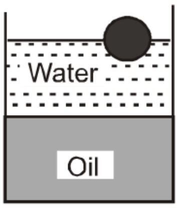
(1) $t = t_0$ (2) $t = t_0/2$ (3) $t = 2t_0$ (4) $t = 4t_0$

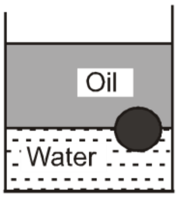
3. A jar is filled with two non-mixing liquids 1 and 2 having densities ρ_1 and ρ_2, respectively. A solid ball, made of a material of density ρ_3, is dropped in the jar. It comes to equilibrium in the position shown in the figure.
Which of the following is true for ρ_1, ρ_2 and ρ_3 ? **[AIEEE 2008, 4/300]**

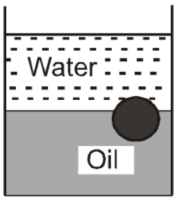


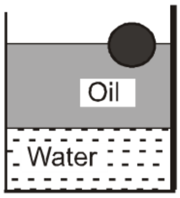
(1) $\rho_1 > \rho_3 > \rho_2$
(2) $\rho_1 < \rho_2 < \rho_3$
(3) $\rho_1 < \rho_3 < \rho_2$
(4) $\rho_3 < \rho_1 < \rho_2$

4. A ball is made of a material of density ρ where $\rho_{oil} < \rho < \rho_{water}$ with ρ_{oil} and ρ_{water} representing the densities of oil and water, respectively. The oil and water are immiscible. If the above ball is in equilibrium in a mixture of this oil and water, which of the following pictures represents its equilibrium position? **[AIEEE 2010, 4/144]**

(1) 

(2) 

(3) 

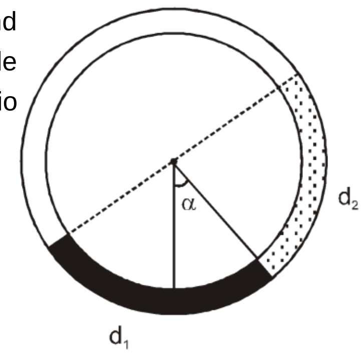
(4) 

5. Water is flowing continuously from a tap having an internal diameter 8×10^{-3} m. The water velocity as it leaves the tap is 0.4 ms^{-1}. The diameter of the water stream at a distance 2×10^{-1} m below the tap is close to : **[AIEEE - 2011, 4/120, –1]**
(1) 5.0×10^{-3} m (2) 7.5×10^{-3} m (3) 9.6×10^{-3} m (4) 3.6×10^{-3} m

6. A uniform cylinder of length L and mass M having cross - sectional area A is suspended, with its length vertical, from a fixed point by a massless spring such that it is half submerged in a liquid of density σ at equilibrium position. The extension x_0 of the spring when it is in equilibrium is : **[JEE(Main)-2013, 4/120, –1]**

(1) $\frac{Mg}{k}$ (2) $\frac{Mg}{k}\left(1-\frac{LA\sigma}{M}\right)$ (3) $\frac{Mg}{k}\left(1-\frac{LA\sigma}{2M}\right)$ (4) $\frac{Mg}{k}\left(1+\frac{LA\sigma}{M}\right)$

7. There is a circular tube in a vertical plane. Two liquids which do not mix and of densities d_1 and d_2 are filled in the tube. Each liquid subtands 90° angle at centre. Radius joining their interface makes an angle α with vertical. Ratio $\frac{d_1}{d_2}$ is : **[JEE(Main)-2014, 4/120, –1]**

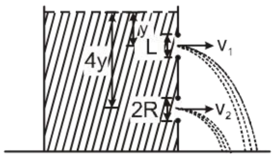


(1) $\frac{1+\sin\alpha}{1-\sin\alpha}$ (2) $\frac{1+\cos\alpha}{1-\cos\alpha}$
(3) $\frac{1+\tan\alpha}{1-\tan\alpha}$ (4) $\frac{1+\sin\alpha}{1-\cos\alpha}$

PART - II : JEE (ADVANCED) / IIT-JEE PROBLEMS (PREVIOUS YEARS)

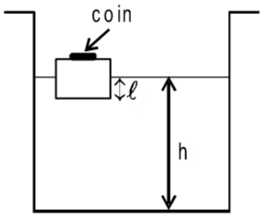
1. An application of Bernoulli's equation for fluid flow is found in **[IIT–JEE (Screening) 1994]**
(A) Dynamic lift of an aeroplane (B) Viscosity meter
(C) Capillary rise (D) Hydraulic press

2. A large open tank has two holes in the wall. One is a square hole of side L at a depth y from the top and the other is a circular hole of radius R at a depth 4y from the top. When the tank is completely filled with water, the quantities of water flowing out per second from both holes are the same. Then radius R, is equal to : **[JEE - 2000, 2/105]**



(A) $\frac{L}{\sqrt{2\pi}}$ (B) $2 \pi L$
(C) L (D) $\frac{L}{2\pi}$

3. A wooden block with a coin placed on its top, floats in water as shown in figure. The distance and h are shown here. After some time the coin falls into the water. Then : **[I.I.T. 2002, 3/105 Screening]**



(A) ℓ decreases and h increase
(B) ℓ increases and h decreases
(C) both ℓ and h increases
(D) both ℓ and h decrease

4. **STATEMENT -1 :** The stream of water flowing at high speed from a garden hose pipe tends to spread like a fountain when held vertically up, but tends to narrow down when held vertically down.
and **[JEE-2008' 3/162]**
STATEMENT -2 : In any steady flow of an incompressible fluid, the volume flow rate of the fluid remains constant.
(A) STATEMENT -1 is True, STATEMENT -2 is True; STATEMENT -2 is a correct explanation for STATEMENT -1
(B) STATEMENT -1 is True, STATEMENT -2 is True; STATEMENT -2 is NOT a correct explanation for STATEMENT -1
(C) STATEMENT -1 is True, STATEMENT -2 is False
(D) STATEMENT -1 is False, STATEMENT -2 is True.

5. A solid sphere of radius R and density ρ is attached to one end of a mass-less spring of force constant k. The other end of the spring is connected to another solid sphere of radius R and density 3ρ. The complete arrangement is placed in a liquid of density 2ρ and is allowed to reach equilibrium. The correct statement(s) is (are) **[JEE(Advanced)-2013, 3/60, –1]**
(A) the net elongation of the spring is $\frac{4\pi R^3 \rho g}{3k}$
(B) the net elongation of the spring is $\frac{8\pi R^3 \rho g}{3k}$
(C) the light sphere is partially submerged.
(D) the light sphere is completely submerged.

Answers

EXERCISE-1

Section (A)

A-1	(3)	**A-2**	(3)	**A-3**	(1)
A-4	(1)	**A-5**	(2)	**A-6**	(1)
A-7	(2)	**A-8**	(1)		

Section (B)

B-1	(3)	**B-2**	(3)	**B-3**	(4)
B-4	(2)	**B-5**	(1)	**B-6.**	(2)
B-7	(1)	**B-8**	(3)	**B-9**	(1)
B-10	(3)				

Section (C)

C-1	(3)	**C-2**	(4)	**C-3**	(3)
C-4	(1)	**C-5**	(3)	**C-6**	(3)
C-7	(3)	**C-8**	(3)	**C-9**	(1)

EXERCISE-2

PART - I

1.	(3)	**2.**	(3)	**3.**	(4)
4.	(2)	**5.**	(1)	**6.**	(1)
7.	(3)	**8.**	(3)	**9.**	(1)
10.	(1)	**11.**	(3)	**12.**	(1)
13.	(1)	**14.**	(2)	**15.**	(1)

PART – II

Section (A)

A-1.	(1)	**A-2.**	(1)	**A-3.**	(1)

Section (B)

B-1. (1→s) ; (2→r) ; (3→q) ; (4→r)

B-2. (1→ –p) ; (2→ – q) ; (3→ – p) ; (4→ – p)

Section (C)

C-1. (1,3) **C-2.** (1, 3, 4) **C-3.** (1,2)

EXERCISE – 3

PART– I

1.	(2)	**2.**	(3)	**3.**	(3)
4.	(2)	**5.**	(4)	**6.**	(3)
7.	(3)				

PART – II

1.	(A)	**2.**	(A)	**3.**	(D)
4.	(A)	**5.**	(A,D)		