

H/W
13/09/21

Numericals

Q1) Find pressure due to water at a depth 2m inside it.

$$\text{Ans) pressure} = \frac{10^3 \text{ kg}}{\text{m}^3} \times 10 \text{ m/s}^2 \times 2$$

$$\approx 20,000 \text{ Pa}$$

Q2) A circular pillar of area of cross section $6 \times 10^{-3} \text{ m}^2$ supports a weight of 60kg. Calculate the pressure exerted on pillar.

$$\text{Ans) area of cross section} = 6 \times 10^{-3} \text{ m}^2$$

$$\text{weight} = 60 \text{ kg} = 60 \times 10 = 600 \text{ N}$$

$$g = 10 \text{ m/s}^2$$

$$\text{pressure} = F/A \approx \frac{600 \text{ N}}{6 \times 10^{-3} \text{ m}^2}$$

$$\approx 10^2 / 10^{-3}$$

$$\approx 10^5 \text{ N/m}^2$$

Q3) The pressure of the water at the surface of pond is _____ than bottom of pond

(a) lower than

(c) same as

(b) higher than

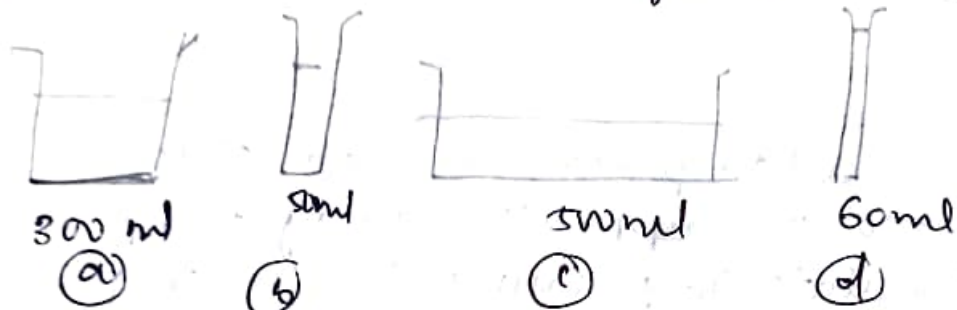
(d) either lower or higher than

Q2) which is not the factor affecting fluid pressure.

- (a) height of fluid
- (b) density of fluid

- (c) color of fluid
- (d) Acceleration due to gravity

Q3) Observe the vessels A, B, C, D carefully. Arrange them in the order of decreasing pressure at the bottom of container.



Arrangement = $D > B > A > C$.

As the pressure at the base of each vessel is given by ρgh where ρ is density of water, g is acceleration due to gravity and h is height of water column.

So \Rightarrow pressure at bottom is \propto height of water level.

~~Q2~~

Q1) A force of 16 N acts on area of 50 cm^2 .
What is the pressure in pascal?

- (a) 3200 Pa
- (b) 4200 Pa
- (c) 5200 Pa
- (d) 2200 Pa.

Q2) What force will produce a pressure of $50,000 \text{ Pa}$ on an area of 0.2 m^2 .

- (a) 10000 N
- (b) 5000 N
- (c) 15000 N
- (d) 20,000 N

Q3) A force of 3000 N while acting on an area A produces a pressure of 1500 Pa . What is the magnitude of A in cm^2 .

- (a) 1000 cm^2
- (b) 3000 cm^2
- (c) 4000 cm^2
- (d) 5000 cm^2 .

Q1) Some piece of impurity (density = P) is embedded in ice. The ice is floating in water (density = P_w) when ice melts, level of water will _____

(ii) fall if $\rho > \rho_w$ (i) remain unchanged if $\rho < \rho_w$

(iii) fall if $\rho < \rho_w$ (iv) rise if $\rho > \rho_w$

(2) (i) statement 1 -

A man sitting in a boat which is floating on a pond. If the man drinks some water from pond the level of water in the pond decreases.

statement - 2 - According to Archimede's principle the weight displaced by body is equal to weight of the body.

Ans) statement - 1 is incorrect (false) and statement - 2 is true.

(i) statement - 1 - A needle placed carefully on a surface of water may float whereas a ball of the same material will always sink.

statement - 2 - The buoyancy of an object depends on both material and shape of object.

(3) statement - (i) is true statement (ii) is false.