CW
19.9.21

Numericals

Home Assignment

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1) Depth of water = 2m
Density of water = 1000 kg/m³
Value of g = 9.8 m/s²

Pressure due to water at depth 2m inside it = ~~ρgh~~
= 1000 × 9.8 × 2
= 98 × 2 × 100
= 19600 P

∴ pressure due to water at depth 2m inside it is 19600 P.

2) Area of circular pillar = 6×10^{-3} m²
Mass supported by the pillar = 60 kg
Force of the object exerted on pillar =
= m × g
= 60 × 9.8 = 98 × 6 = 588 N

Pressure exerted on the pillar = $\frac{F}{A}$
= $\frac{588}{3 \times 10^{-3}}$ = 196000 P

Therefore the pressure exerted on the pillar is 196000 P.

3) a) When the valve will be removed the direction of flow of water will be from A to B, where the level of water in arm B will rise.

This happens because in arm A more water is present which will exert more force than the water present in arm B. So water level in arm A will come down and water level in arm B will go up.

b) From hole D water travels the farthest because pressure in a liquid increases with depth because further down we go greater is the weight of liquid column above it. Thus as point D is at the lowest depth, the weight of the liquid column above it is the most. Therefore from point D water travels the farthest.

4) a) Lower than

5) c) Colour of fluid

6) On arranging the orders of decreasing pressure at the bottom of containers, we get

$D > B > A > C$

This happens because pressure at a point in liquid is given by ρgh. As height of the liquid column above the base is greatest in D, then B, then A and least in C and for each container value of g and density of water is same, therefore pressure at the base of containers is greatest in D, then B, then A and least in C.

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1) a) 3200 Pa

2 a) 10000 N

3) Answers not in options

Ans) $2000\ cm^2$

Pressure produced = 1500

Force applied = 300

Area on which the force acts = A

AS $P = \frac{F}{A}$

$A = \frac{F}{P} = \frac{300}{1500} = \frac{3}{15} = \frac{1}{5} = 0.2 m^2$

∴ Area in cm^2

$= 0.2 \times 10000 = 2000 cm^2$

HOME ASSIGNMENT

(1) i) fall if $p \geq p_w$

2 i) (i) Statement 1 is true, Statement 2 is False, Statement 2 is correct explaination of Statement 1.

(ii) (iii) Statement 1 is true but Statement 2 is false.