HOME ASSIGNMENT (Numericals):-

1. Find pressure due to water at a depth 2m inside et (Given density of water = $1 g/cm^3 = 1000 kg/m^3$)

Ans) Hydrostatic Pressure = $\rho g h$

given $\rho = 10^3 kg/m^3$, $g = 10 m/s^2$, $h = 2m$

Pressure = $10^3 \frac{kg}{m^3} \times 10 \frac{m}{s^2} \times 2 = 20000$ Pa

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

Ans) Given = Area of cross section = $6 \times 10^3 m^2$

= Weight = 60kg = $60 \times 10 = 600 N$

= $g = 10 m/sec^2$

To find = Pressure on the pillar

= Pressure = $\frac{F}{A}$

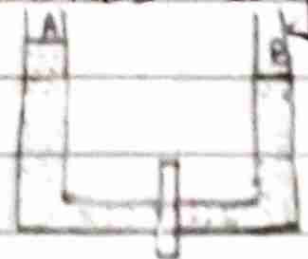= $600 N / 6 \times 10^3 m^2$

= $10^2 / 10^3 = 10^5 N/m^2$

So, The pressure on the pillar is $10^5 N/m^2$

3.(a) The levels of water, in the two arms of A & B of a U-tube, are shown in the diagram. A valve is put in between the 2 arms. State the direction of flow of water, when this valve is removed, and give the reason for the same.

Ans) As water flows from high level to low level, so it will flow from A to B.

(b) from which hole water travels the largest distance? why?
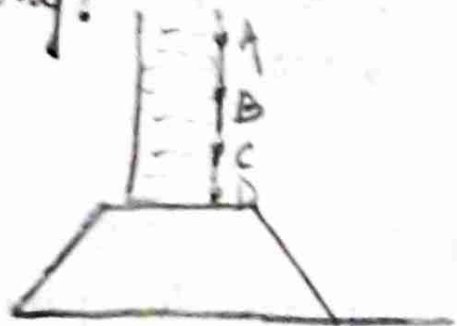
Ans) As we know, pressure in a liquid increases with depth because the further down we go the greater the weight of the liquid above. So that's why in figure water spurts out the fastest and furthest (covering largest distance) from hole 'D'.
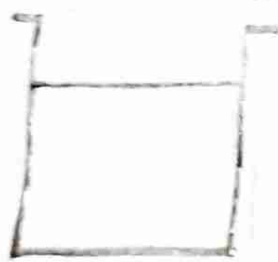
→ Questions:-

(3) The pressure of the water at the surface of the pond is lower than that at the bottom of the pond.

(a) Lower than

(9) which is not the factor affecting fluid pressure?

(c) color of fluid

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

300ml
A

50ml
B

500ml
C

60ml
D

➜ B, A, C because pressure of a liquid column depends upon the height of the liquid column and not on the volume of the liquid

➜ Questions :-

1. A force of 16N acts on an area of 50 cm². what is the pressure in pascal?

Ans) (a) 3200 pa

force = 16 N

Area = 50 cm² = 0.005 m²

pressure = force / area

So, 16/0.005 = 3200 pa

2. what force will produce a pressure of 50000 Pa on an area of 0.2 m²

Ans) (a) 10000N

$$pressure = \frac{force}{Area}$$

force = pressure × Area

force = 50000 × 0.20

force = 10000N

3. A force of 300N, while acting on an area A, produces a pressure of 1500 Pa. what is the magnitude of A in cm².

Ans) 2000 cm

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

1500 = 300/A

$\eta = 3\rho/1500 = 3/15 = 1/5 \, gm^2$

$1 m^2 = 10^4 cm^2$

$1/5 \, m^2 = 10^4 \times 1/5 = 2 \times 10^3 \, cm$

1. Some piece of impurity (density= ρ) is embedded in ice. The ice is floating on water. (density = ρ_w) when ice melts, level of watere will.

(a) Remain Unchanged, if $\rho < \rho_w$
as melted ice water displaces water and occupies volume and overall volume does not change

2. Each question contains statement -1 (Assertion) and Statement -2 (Reason). Each question has 5 choices (1), (2), (3) & (4) and (5) out of which only one is correct.

Statement 1: 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.

Statement 2: According to Archimede's principle the weight displaced by the body is equal to the weigh of the body.

Ans) (D) Assertion is Incorrect and Reason is correct.

→ **Statement 1:** A needle place carefully on the surface of water may float, whereas a ball of the same material will always sink.

→ **Statement 2:** The buoyancy of an object depends both on the material and shape of the object.

Ans) Assertion is correct but Reason is incorrect.