Drava Balangal

Que.1. write the odd one from the following **[Marks :(1)]**

hydrolic jack, hydrolic press, escavator, hydrometer

Ans. hyrometer

all others work in Pascal's law

Que.2. **[Marks :(2)]**

a) Hydrometer - Law of flotation

Escavator - .....

b) Viscous liquid - honey

.....Kerosene

Ans.

a) Pascal's Law

b) Mobile liquid –

Que.3. The area of cross-section of the first end of a U-shaped tube is 0.001 m2 and that of the second end is 1 m2 respectively. On applying a force on the first end of the tube, a force of 12000 N was experienced at the second end. Calculate the force exerted on the first end of the tube. **[Marks :(2)]**

Ans.

$$\frac{F_1}{F_2} = \frac{A_1}{A_2}$$

$F_1 = ?$

$F_2 = 12000\ N$

$A_1 = 0.001\ m^2$

$A_2 = 1\ m^2$

$$\frac{F_1}{12000} = \frac{0.001}{1} \quad F_1 = 0.001 \times 12000 = 12\ N$$

Que.4. Hydraulic jacks are used in service stations to lift a car for cleaning. **[Marks :(4)]**

a) Name the working principle of Hydraulic Jack

b) State the law

c) Write down two devices working on the above principle.

Ans. a) Pascal's Law

b) The pressure applied at any point of a liquid at rest in a closed system will be experienced equally at all parts of the liquid.

c) Hydraulic brake

Hydraulic press

Que.5. A Hydrometer is used to measure the relative density of a fluid. [Marks :(2)]

a) What is meant by Relative density?

b) What is the working principle of Hydrometer?

Ans. a) Relative density of a substance is the ratio of the density of the substance to the density of water.

b) Law of floatation.

Que.6. The relative density of kerosene is 0.81. [Marks :(4)]

a) What do you mean by relative density?

b) Calculate the density of kerosene.

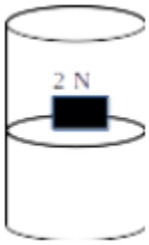
Ans. a) Relative density of a substance is the ratio between the density of a substance to the density of water.

b) 0.81 = density of kerosene / 1000 kg/m^3

density of kerosene = 0.81 X 1000

= 810 kg/m^3

Que.7. Consider an object weighing 2 N is floating in water. [Marks :(4)]



a) Name the forces experienced by the object.

b) What will be the weight of the liquid displaced by the object? Give reason.

Ans. a) The object will experience its weight downwards and buoyant force upwards.

b) Weight of the liquid displaced by the object is 2 N.

An object floats in a liquid when its weight is equal to the buoyant force exerted by the liquid.

Que.8. The readings obtained in overflowing jar experiment is tabulated below - [Marks :(3)]

Object	Weight of the object	Weight of the displaced water
A	**3 N**	**2.6 N**
B	**3.5 N**	**3.5 N**

a) Which of the above object is likely to submerge in water?

b) State Law of Floatation on the basis of the above observations.

Ans. a) A

b) When an object is fully immersed in a liquid, weight of the object and the weight of the displaced liquid will be equal.

Que.9. The observations of the overflowing jar experiment to find out the relation between buoyant force and the weight of displaced liquid are tabulated below. [Marks :(3)]

object	weight in air	weight in water	loss of weight (buoyant force)	weight of the displaced water
stone	**3 N**	**2.8 N**	**0.2 N**	**0.2 N**
iron block	**4.2 N**	**3.9 N**	**0.3 N**	**0.3 N**

a) What is the relation between the buoyant force and weight of the overflowing water?

b) State the law arrived at from the above experiment.

Ans. a) The buoyant force and the weight of the overflowing liquid will be the same.

b) Archimedes' Principle - When an object is partially or completely immersed in a fluid, the buoyancy experienced by it will be equal to the weight of the fluid displaced by it.

Que.10. Two differrent objects when placed in water shows the following measurements - [Marks :(3)]

Object	Weight in water
X	2 N
Y	2.5 N

a) Which object will experience more buoyant force?

b) Which property of the two objects X, Y is responsible for the change in buoyant force?

Ans. a) Object X will experience more buoyant force.

b) The volume of the two objects will be different even if the mass is same. When volume of objects increase, buoyancy also increases.

Que.11. It is observed that objects with same mass experienced different buoyant forces in the same liquid.
[Marks :(3)]

a) What do you mean by buoyant force ?

b) What are the factors that affect buoyant force ?

Ans. a) The force exerted by a fluid on an object.

b) Density of the fluid, volume or density of the object

Que.12. Weight of an iron block when immersed in different liquids are tabulated below. Observe the table and answer the following - [Marks :(3)]

Liquid	Loss of weight
X	1 N
Y	1.2 N
Z	1.5 N

a) What causes weight loss ?

b) Of these X is likely to be which of the following -

(brine, kerosene, water)

c) Which concept helped you to select the liquid in the above question ?

Ans. a) Buoyant force

b) kerosene

c) (i) buoyancy decreases when density decreases

(ii) the density of kerosene is less when compared to the other two liquids.

Que.13. An object is suspened on a spring balance .It shows a weight of 40N in air and 30N in water. Then,
[Marks :(4)]

a) Write the buoyancy experienced.

b) What is the weight of the water displaced by the object?

c) What is the volume of the water displaced by the object?

d) if the density of water is 1000 kg/m^3 . What is the volume of the object?

Ans.

a) - 10 N

b)- 10 N

c) volume =mass/density

weight of water= 10 N = mg

g= 10 m/s^2

m=$\frac{10}{10}$ = 1 kg

ഘനവ്യാപ്തം = 1/1000

= $10^{-3}m^3$

d) $10^{-3}m^3$

Que.14. What is the relative density of the liquid having density 810 kg/m^3 ? [Marks :(2)]

Ans. -0.81

Que.15. A stone of mass 800 g is submerged in water taken in a beaker. If the mass of displaced water is 200 g ,calculate the weight of stone in water (value of g = 10 m/s^2)

Ans. weght of stone = 0.8x10 = 8 N

buoyant force = 0.2x10=2N

weight of stone in water = 8-2=6N