Physical Quantities and Measure

4 (a) False
b) False
c) True
d) True
e) False
f) False
g) True
h) False
i) True
j) True

3. a - iv
b - i
c - v
d - ii
e - iii

3a) 1000
b) Volume
c) $kg\ m^{-3}$
d) 1000
e) 1000
f) more
g) less
h) more
i) equal to
j) zero

4a) (i) Mass = D x V

b) (i) 800 kg m^{-3}

c) (iii) 48 g

d) (i) The mass of certain volume of brass is more than the 6 of mass of equal volume of aluminium

e) (ii) The density bottle will store 25ml of any liquid

f) (iii) The buoyant force on a body is equal to weight of liquid dispersed by it.

g) (iii) Equal to weight of wood piece.

h) (i) Sink

Short Q/A

1. When the molecules of a substance are closely packed than any other substance ex- Iron, wood In this example we know that Iron's molecules are tightly packed and has more mass and volume. This is known as density.

2. S.I unit of density is $kg\,m^{-3}$.

$1\ kg\ m^{-3} = 10^{-3}\ g\ cm^{-3}$

$1\ g\ cm^{-3} = 1000\ kg\ m^{-3}$

3. The statement refers to how much density the brass has in C.g.S system

4. Water
Mercury
Cork
Brass
Iron

5. The density of a fluid varies temperature increase density decreases but temperature decrease density increase

6. c) Density cause ~~cr to c~~ liquid if it is heated density will increase

Activity

7. Get a beaker full of water and weight it. Place the coin inside the water and weigh the displaced weight as V. Now find ratio and that will be density of coin.

8. Activity 3

* Take a beaker. Measure the mass of the empty beaker using a common beam balance. Let the mass be M_1 gram.

* Now take a measuring cylinder and pour milk into it to a certain level say 50ml. Thus, volume of milk V = 50 mL or $50\ cm^3$

* Transfer the milk into the empty beaker. Measure its mass again. Let the mass of beaker with milk be M_2 gram.

* Find the difference $M_2 - M_1$ which gives the mass M of the milk. Thus, mass of the milk $M = (M_2 - M_1)$ gram. Let M = 51.5 gram

* Calculate
$D = \frac{M}{V}$

$= \frac{51.5}{50} = 1.03\ g\ cm^{-3}$

9. Density bottle is a specially designed bottle which is specially designed to measure the density of a liquid.
The density bottle having a glass stopper at its neck it can store a fixed amount of water in it's neck. The stored volume is 25 or 50 ml.
The stopper has a narrow hole through it. When the bottle is filled with the liquid and stopper is inserted the excess liquid rises through the hole and drains out. Thus the bottle always contains same volume

10

13 Relative density of a substance is defined as:-

$$R.D = \frac{\text{Density of substance}}{\text{Density of water}}$$

11 There is no unit of relative density

12

12.

Density	Relative Density
Density is Mass per unit volume	Relative density Density of substance divided by density of water

13 Means that the mass is 2.7 times that of the volume of water.

14. If the density of a body is higher than that of liquid it will sink, if the density of a body is less than the density of water it will float

15 A cork piece has less density if compared to ~~water~~ (water) So it floats on water while Iron nail has more density than water so it sinks.

16. a- Float
b- Sink
c- ~~Float~~ Sink
d- Float

17. The law of flotation states that if a body floats on water the liquid displaced by its immersed part is equal to the total weight of the body. This is the law of flotation

18a) Sink
b) Float

19a) Sample
b) Liquid A
c) Liquid C

20. ~~The weight of~~ the displaced ~~body~~ liquid ~~is the w~~

20 The body will float in liquid the buoyant force exerted.

20 According archimedes' principle the buoyant force is the weight of fluid displaced. So for a floating object the weight of displaced liquid is equal to weight of object.

24 Density of ice is 900 kg m^{-3}, while density of water 1000 m^{-3} so $\frac{9}{10}$ parts floats.

25

22 Iron needle sinks in water and iron ship doesn't ships made of iron are hollow and it occupies higher surface area so iron needle sinks in water while ship made up of Iron doesn't.

23 Sea water has high density so we can swim easily while river has low density so its we will sink if we swim and river water.

24. Icebergs have $\frac{1}{10}$ part of the whole body under water so a ship can collide with the invisible part present under water so it's dangerous for ship

25 In water buoyant force exerts pressure the weight of stone, hence we can lift in water. So it's easy to lift stone under water.

26 A Submarine is a water-tight boat which can dive inside water.
A Submarine has water tanks. To make Submarine dive. To make rise these tanks are emptied and it rises

27. A helium filled balloon rises in air. The reason is that the density of these gases is less than the density of air. Therefore the buoyant force lifts the weight of balloon.
So a helium filled balloon rises up in air.