



Studybeesofficial

Where Minds Pollinate

**Class 9
Physics**

Chapter 7

Handwritten Notes

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Sep, 3, 2025

classwork

wednesday

Chapter #07

Numerical #1

(a)

$$\text{mass} = 300\text{g}$$

$$\text{Volume} = 150\text{cm}^3$$

$$\rho = ?$$

Sol.:

$$\rho = \frac{m}{V}$$

$$\rho = \frac{300\text{g}}{150\text{cm}^3} = 2\text{g/cm}^3$$

(b)

$$\text{mass} = 500\text{g}$$

$$\text{Volume} = 50\text{cm}^3$$

$$\rho = ?$$

Sol.:

$$\rho = \frac{m}{V}$$

$$\rho = \frac{500\text{g}}{50\text{cm}^3} = 10\text{g/cm}^3$$

Numerical #02

$$U = 500 \text{ ml}$$

$$m = 450 \text{ grams}$$

$$\rho = ?$$

$$\rho = \frac{m}{U}$$

$$\rho = \frac{450 \text{ g}}{500 \text{ ml}} = 0.9 \text{ g/ml}$$

Numerical #03

$$70 = l$$

$$10 = b$$

$$30 = h$$

$$\text{mass} = 2500 \text{ g}$$

$$l \times b \times h = \text{Volume}$$

$$70 \times 10 \times 30 = 21000 \text{ cm}^3$$

$$\rho = \frac{m}{V}$$

$$\rho = \frac{2500 \text{ g}}{21000 \text{ g cm}^3}$$

$$\rho = 0.12 \text{ g/cm}^3$$

Numerical # 04

$$\rho = 2700 \text{ kg/m}^3$$

$$m = ?$$

$$a = 2.5 \text{ cm} = 0.25 \text{ meter}$$

$$r = \frac{0.25}{2} = 0.125$$

sol:

$$\text{Volume of sphere} = \frac{4}{3} \pi r^3$$

$$V = \frac{4}{3} \pi (0.125)^3 = 8.18123 \times 10^{-3}$$

$$m = \rho \times V = 8.18123 \times 10^{-3} \times 2700$$

$$m = 22.1 \text{ kg}$$

Numerical # 05

$$V = l^3$$

$$V = 10^3 = 1000$$

$$m = 0.5 \text{ kg} = 500 \text{ g}$$

$$\begin{array}{r} 1 \\ 83 \overline{) 8329} \\ \underline{83} \\ 29 \\ \underline{29} \\ 0 \end{array}$$

Volume of cube = cavity + iron filled

$$\rho = \frac{m}{V}$$

$$V = \frac{m}{\rho} = \frac{500}{7900} = 0.063291$$

$$1000 - 63.29 = 936.71 \text{ cm}^3$$

Numerical # 06

$$\text{mass} = 200\text{g}$$

$$U_i = 40\text{ml}$$

$$U_f = 73\text{ml}$$

$$\text{Volume} = ?$$

$$\rho = ?$$

$$\rho = \frac{m}{V}$$

$$U = \rho$$

$$U =$$

$$\rho = \frac{200}{33}$$

$$\rho = 6.10\text{g/ml}$$

$$= U_f - U_i$$

$$= 73 - 40$$

$$= 33\text{ml} = V$$

$$\frac{10,000 \times 20^2}{50} = \sqrt{10^2} r$$

Chapter # 07

Density :- Mass per unit Volume

$$\rho = \frac{M}{V} = \frac{\text{kg}}{\text{m}^3} = \frac{\text{g}}{\text{cm}^3} = \frac{\text{g}}{\text{m}^3}$$

Factors :-

- 1) mass
- 2) Volume

if Volume is constant

$$\uparrow \rho \propto m \uparrow$$

If m is constant

$$\downarrow \rho \propto \frac{1}{V} \uparrow$$

$\therefore$ **Density of :-**

Solid > Liquid > gas

4°C of water is at
highest

Density does not
depend upon amount
of substance - It changes only
if we change Material -

$$\frac{1g}{1m^3} = \frac{10g}{10m^3} \quad \text{water}$$

- Water shows anomalous/strange behavior

$$4^\circ \rightarrow P \uparrow$$

$$0^\circ \rightarrow P \downarrow$$

Solids : (Regular)

(i) cuboid,

(length $\times$ width $\times$ height)

(ii) cube:-

$$l^3$$

(iii) Sphere:-

$$\frac{4\pi r^3}{3}$$

(iv) cylindrical:-

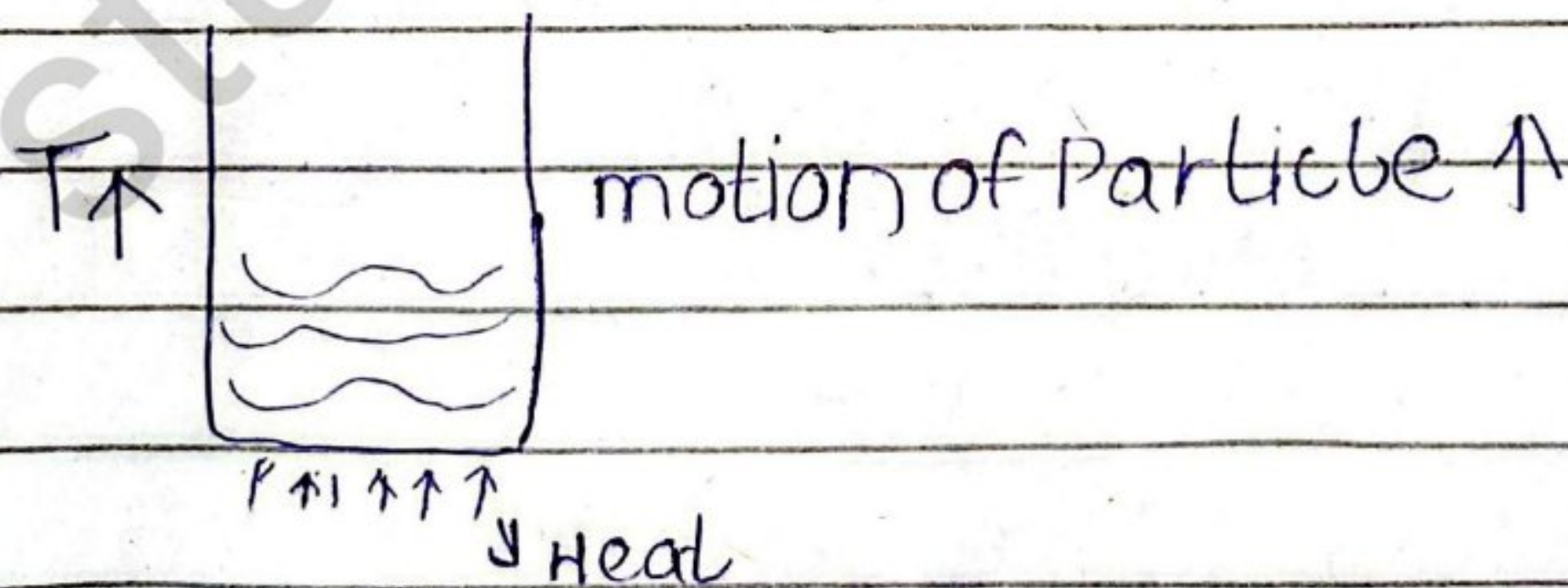
$$V = \pi r^2 h$$

Plasma:- Ionic state of matter and 4th state of matter. Almost 99% of visible ~~the~~ universe is made up of plasma - It is good conductor of electricity -

Q How Plasma is formed?

Plasma can be formed by applying high pressure, high temperature, strong Electric field, strong magnetic field -

Relation b/w Temperature and motion of particle:-

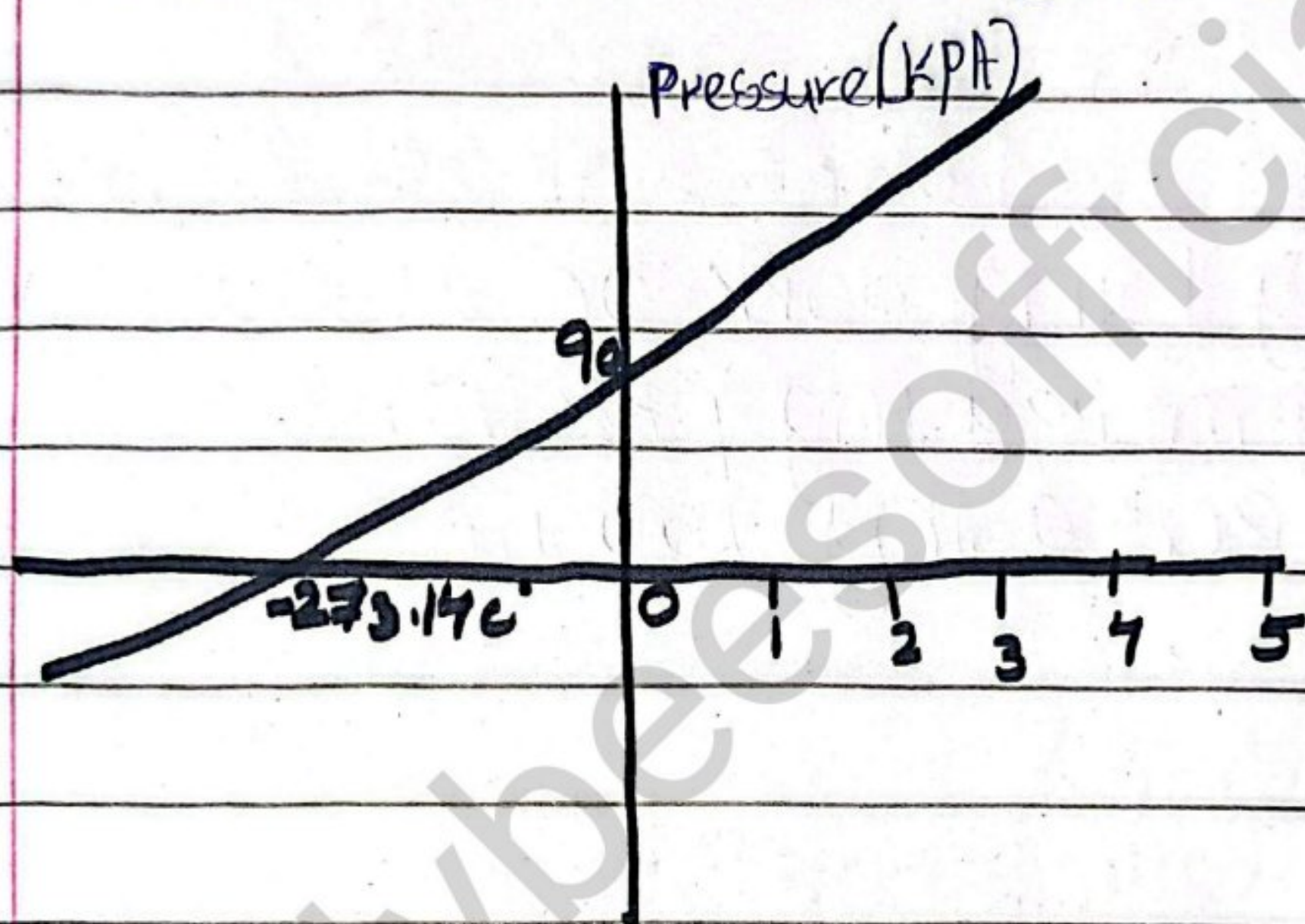


$$T \propto \text{motion of particle}$$
$$T \propto K \cdot E$$
$$T \propto K \cdot E_{\text{Avg}}$$

(T) increases :

- i) $KE \propto$ Speed of particles
- ii) Intermolecular forces $\downarrow$
~~low~~ (bond break)

$0K = \text{absolute zero} = KE = 0$



$T = C / K / F$

$$T(K) = T(C) + 273$$

$$T(C) = T(K) - 273$$

$$T(F) = \frac{9}{5}C + 32$$

or

$$T(F) = 1.8C + 32$$

$$T(C) = \frac{T(F) - 32}{1.8}$$

1.8

convert normal human body temperature in Kelvin and Fahrenheit

Q At what temperature are C° and Fahrenheit

are equal -

$$\text{Ans } T(F) = 1.8T(C) + 32$$

$$X = 1.8T(C) + 32$$

$$-32 = 1.8X + X$$
$$\frac{-32}{2.8} = X = -10$$

Internal Energy: Sum of K.E and potential energy -

P.E = Solid > liquid > Gas

K.E = Solid < liquid < Gas

Q Can you name any method that can increase internal energy
By doing work on system
By increasing pressure and decreasing volume -

Thermistor's:

↓
Heat

↓
Resistance

$\uparrow T \propto R \downarrow$

Energy = 0

$\downarrow T \propto R \uparrow$

Energy $\neq$ 0

Like: Fire alarm

Def.: Thermocouple thermometer is a sensor which is used to measure temperature

Thermocouple ::

- Two pairs of wires having different electrical thermal conductivity - joined together at two junctions -
- It works on Principles of seebeck effect -

$$\uparrow \text{Sensitivity} \propto \frac{1}{\text{diameter}} \downarrow$$

Liquids that can be used in thermometer ::

H₂O	low density, Freezing point high, (-114) - (-78)	Boiling point low
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Hg	high	Freezing point low, (-39°C, -358°C)	Boiling point High -
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Alcohol	lower than Hg, Freezing point lowest, low boiling point -
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§ Range & Size of Bulb

$$\text{Sensitivity} \propto \frac{1}{\text{Size of Bulb}}$$



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