

# " Physics Lab 1 "

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→ exp 1:-

$$\rho = \frac{\text{Mass}}{\text{Volume}} = \frac{M}{V}$$

$$V = L \times W \times T$$

$$\frac{\Delta \rho}{\rho} = \frac{\Delta M}{M} + \frac{\Delta V}{V}$$

$$\frac{\Delta V}{V} = \frac{\Delta L}{L} + \frac{\Delta W}{W} + \frac{\Delta T}{T}$$

$$a = \sqrt[3]{\frac{A_w}{\rho N_a}} \rightarrow \frac{\Delta a}{a} = \frac{1}{3} \frac{\Delta \rho}{\rho}$$

→ exp 2:-

$$\vec{p} = m \vec{v}$$

$$R = \frac{\rho_a}{\rho_b} = \frac{m_1 \bar{x}_{1a} + m_2 \bar{x}_{2a}}{m_1 \bar{x}_{1b}}$$

let  $R = \frac{A}{B}$  ,  $\frac{\Delta R}{R} = \frac{\Delta A}{A} + \frac{\Delta B}{B}$

→ exp 3:-

$$\rho_1 L_1 = \rho_2 L_2 \text{ , } \rho_i \rightarrow \text{كثافة الماء } 1 \text{ g/cm}^3$$

$$\rho_2 = \frac{L_1}{L_2}$$

$$\Delta L_1 = \Delta L_2 + \Delta L_3$$

$$\Delta L_2 = \Delta L_1 + \Delta L_3$$

$$\frac{\Delta \rho}{\rho} = \frac{\Delta L_1}{L_1} + \frac{\Delta L_2}{L_2}$$



→ exp 4:

$$R_{exp} = \frac{V}{I}$$

$$\frac{\Delta R}{R} = \frac{\Delta V}{V} + \frac{\Delta I}{I}$$

$$R_{true} = A B \times 10^C$$

$$\Delta R = (A B \times 10^C) D$$

From color code.

R in series : توالي

$$R_s = R_1 + R_2$$

$$\Delta R_s = \Delta R_1 + \Delta R_2$$

R in series : توازي

$$R_p = \frac{R_1 R_2}{R_1 + R_2}$$

$$\Delta R = R_p^2 \left( \frac{\Delta R_1}{R_1^2} + \frac{\Delta R_2}{R_2^2} \right)$$

exp 5:-

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

u: distance between the object and lens

v: distance between the lens and image.

$$\frac{\Delta f}{f^2} = \frac{\Delta u}{u^2} + \frac{\Delta v}{v^2}$$

exp 6:

$$\mu = \frac{c}{v}$$

$$\mu_a \sin(i) = \mu_b \sin(r)$$

$$\mu \geq 1$$

$$\mu_b = \frac{\sin(i)}{\sin(r)}$$

$$\frac{\Delta \mu}{\mu} = \frac{\cos(i)}{\sin(i)} \Delta i + \frac{\cos(r)}{\sin(r)} \Delta r$$



Shaimaa

→ Exp 7:

$$L = s + \frac{d}{2}$$

$$T^2 = \frac{4\pi^2 L}{g}$$

$$T = 2\pi \sqrt{\frac{L}{g}}$$

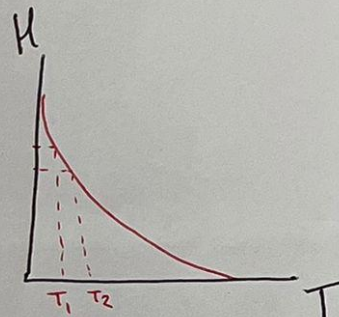
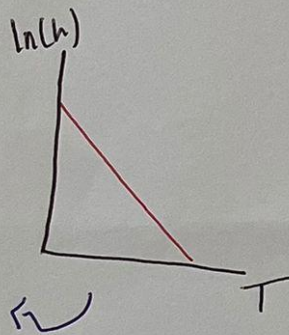
$$g = \frac{4\pi^2 L}{T^2}$$

$$\frac{\Delta g}{g} = \frac{\Delta L}{L} + 2 \frac{\Delta T}{T}$$

→ exp 8:

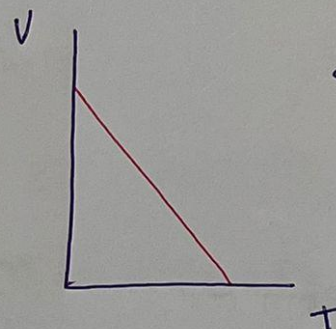
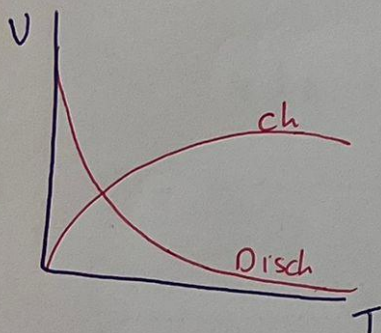
$$t_{1/2} = \frac{\ln(2)}{\lambda}$$

$$\text{slope} = -\lambda$$



$$t_{1/2} = T_1 - T_2$$

exp 9:



$$\text{slope} = \frac{\ln(v_2) - \ln(v_1)}{t_2 - t_1}$$

$$T_s = -\frac{1}{\text{slope}}$$

$T_c, T_D$

$$* C = \frac{\tilde{r}}{R}$$

$$\Delta C = C \left( \frac{\Delta T}{T} + \frac{\Delta P}{P} \right)$$