17) $W = ?$ $\Rightarrow$ lifting $\Rightarrow$ work against gravity

$m = .1\ kg$

$d = .3\ m$

$W = F d = \Delta E_T$

$W = (.981\ N)(.3\ m)$

$= .294\ N \cdot m$ or J

Convert m to Force

$F_g = m a$

$= (.1\ kg)(9.81\ m/s^2)$

$= .981\ N$

---

18) 2 electrons $\Rightarrow$ same charge both negative $\Rightarrow$ repel

$r = 3.00 \times 10^{-6}\ m$

$$F_e = \frac{k\, q_1 q_2}{r^2}$$

$$F_e = \frac{\left(8.99 \times 10^{9}\ \frac{N \cancel{m^2}}{\cancel{C^2}}\right)\left(1.6 \times 10^{-19}\ \cancel{C}\right)\left(1.6 \times 10^{-19}\ \cancel{C}\right)}{\left(3 \times 10^{-6}\ \cancel{m}\right)^2}$$

$$F_e = 2.56 \times 10^{-17}\ N$$

19) W = work (electrical energy)

$$V = \frac{W}{q} \qquad W = Vq$$

1) $W = (2V)(1.6 \times 10^{-19} C)$

3.2×10^{-19} J

2) $W = (2V)(1 \times 10^{-9} C)$

2×10^{-9} J

3) $W = (4V)(1.6 \times 10^{-19} C)$

6.4×10^{-19} J

* 4) $W = (4V)(1 \times 10^{-9} C)$

4×10^{-9} J

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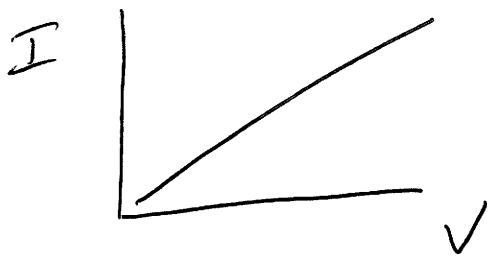
20) R I V ohms law

$$R = \frac{V}{I} \qquad \uparrow V = \uparrow I \uparrow R$$



21) $V = f\lambda$

frequency does not change when a wave enters a new medium $\Rightarrow$ color doesn't change

$\Rightarrow$ f $\quad V \uparrow \Rightarrow \lambda \uparrow$

$\uparrow V = f \lambda \uparrow$

---

22) $\frac{W \cdot S}{\frac{J}{S} \cdot S}$ JOULE $\Rightarrow$ ENERGY

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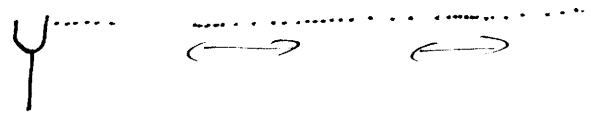
24) SOUND WAVES ARE MECHANICAL WAVES THAT TRAVEL LONGITUDINAL



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25) PARALLEL CIRCUIT

POTENTIAL DIFFERENCE $\Rightarrow$ VOLTAGE

$V_T = V_1 = V_2 = V_3 \Rightarrow$ ALL ARE EQUAL

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26) $V = 3.6V$

$t = 5m \times 60s = 300s$

$P = .064W$

$I = ?$

$P = VI = I^2R = \frac{V^2}{R}$

$P = VI$

$I = \frac{P}{V} = \frac{.064W}{3.6V} = .018A$