p7#6

Nom #1

Date

$q_1 = 3.12 \times 10^{-6} C$ $\quad \because \mu = 10^{-6}$

$r = 12.3\ cm = 12.3 \times 10^{-2}\ m$ $\quad \because c = 10^{-2}$

$q_2 = 1.48 \times 10^{-6} C$

$f = ?$

$K = 9 \times 10^9$

$F = \frac{K\ q_1 \cdot q_2}{r^2}$ N

2 mass of $\bar{e} = 9.1 \times 10^{-31}$

$E = F/q_0$ $\quad E = K\frac{q}{r^2}$ proton

$p = 1.6 \times 10^{-19} C$

$m = 1.67 \times 10^{-27} C$

$E = F/q_0$ $\quad \because F = ma$

$E = \frac{m_0 a}{q_p}$

$E = \frac{(1.67 \times 10^{-27})(9.8)}{(1.6 \times 10^{-19})}$

$\bar{e}$:

$E = \frac{(9.1 \times 10^{-31})(9.8)}{(1.6 \times 10^{-19})}$ N/C

3

$q_0 = ?$

$d = 12.3\ cm$ $\quad 12.3 \times 10^{-2}\ m$

$E = 20.3\ N/C$

Date

$E = F/q_0$

$E = \frac{kq}{r^2}$

$2.3 = \frac{9\times10^9 \times q_0}{(12.3\times10^{-2})^2}$

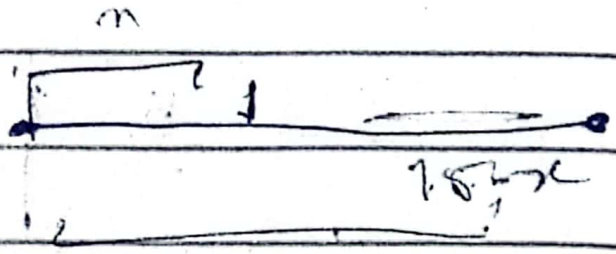
$q_0 =$ C

4

$q_1 = 2\times10^{-6}$ C $\quad q_2 = 6\times10^{-6}$ C

$d = 1$ m

$E = 0$



$E_1 = E_2$

$\frac{kq}{r_1} = \frac{kq}{r_2}$

$\frac{q\ 2\times10^{-6}}{(x^2)} = \frac{q}{(1.5-x)^2}$

$$\frac{Kq_1q_2}{r} + \frac{Kq_1q_2}{r} + \frac{Kq_1q_2}{r}$$

Date

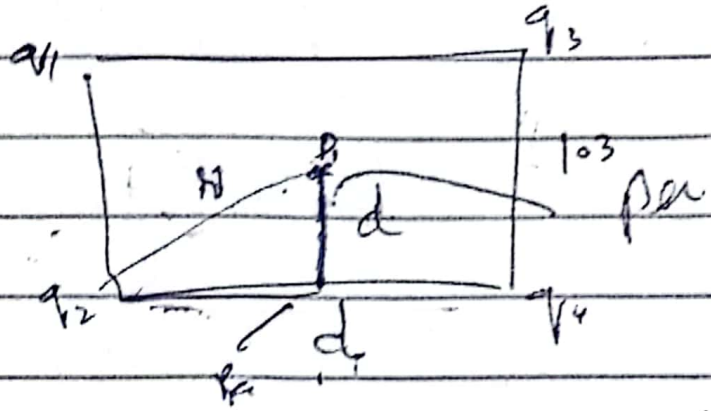
$$E = \frac{F}{q_0} \quad \frac{Kq_1q_2}{r^2} \quad \frac{J}{C}$$

$$\frac{Kq_0}{r^2} \quad \frac{1}{4\pi\varepsilon_0} \quad \frac{Q}{r}$$

$$dE \quad dq$$

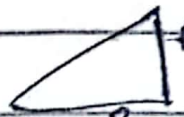
electric potential energy

$$U = \frac{Kq_1q_2}{r} \text{ J}$$



potential

$$V = \frac{Kq_1}{r} \text{ Volt}$$



$$r^2 = d^2 + d^2$$

$$r^2 = \left(\frac{d}{2}\right)^2 + \left(\frac{d}{2}\right)^2$$

$$r^2 = \frac{2d^2}{4}$$

$$r^2 = \frac{d^2}{2}$$

$$r = \frac{d}{\sqrt{2}}$$

$$C = \frac{\varepsilon_0 A}{d}$$

Date

$C = \frac{\varepsilon_0 A}{d}$ without di-electric

$C = KC$ In dielectric

Dal

Side $= 5 \times 10^{-2}$ m

d. 1mm 1×10^{-3} 4m $= 10^{-3}$

$C = \frac{\varepsilon_0 A}{d}$ [F] $\varepsilon_0 = 8.85 \times 10^{-12}$

b) 10V

Q =

$Q = CV$ [Col]

c) $W = \frac{1}{2} \frac{Q^2}{C}$

$U = \frac{1}{2} \frac{CV^2}{C}$

$U = \frac{1}{2} CV^2$

$U = \frac{1}{2} QV$ [Joule]

flux
B   magnetic flux density $B = T$
L = Inductance : H
emf = V   Date

Magnetism

n = 1

$N = 400$

$L = 8\, mH \quad 8 \times 10^{-3}$

$\phi = ?$ flux density

$I = 5\, mA \quad 5 \times 10^{-3}$

(a)

$N\phi = LI$

$\phi = \frac{LI}{N}$ Wb

(b)

$l = 0.2\, m$

$B = ?$ magnetic flux density

$B = \frac{\mu_0 N I}{l}$ Tesla [T]

l = length

$\mu_0 = 4\pi \times 10^{-7}$

2

$emf = 3\, mV \quad 3 \times 10^{-3}\, V$

$\frac{di}{dt} = 5\, A/sec$

$I = 8\, A$

$\phi = 40 \times 10^{-6}$ Wb

$L = ?$ inductance

$N\phi = LI$

Date

$$emf = L \frac{d}{dt}$$

$3 \times 10^{-6} = L \cdot 5$

$\boxed{L = \quad H}$

b) N = no of turn

$N\Phi = i I$

$N = \frac{L I}{\Phi}$

$N =$

Q3

$L = ?$ H

$N = 380$

$I = 27 \times 10^{-2}$ m

$A = 4 \times 10^{-4}$ m^2

$emf = ?$ V

$\frac{d\Phi}{dt} = 45$

$emf = L \frac{d}{dt}$

$\frac{d}{dt}$

$\boxed{emf = \quad V}$

$B = \mu_0 \frac{N I}{l}$

$l = \mu_0 N^2 A$

$4\pi \times 10^{-7}$