

## Quiz 1 Formulae

The formula sheet will be provided in class tomorrow

### Unit 11- RC Circuits

$$C = \frac{Q}{V}$$

#### Charging a Capacitor

$$\text{Charge on capacitor } q(t) = C \Delta V_{\text{batt}} (1 - e^{-\frac{t}{RC}}) \quad I(t) = \frac{\Delta V_{\text{batt}}}{R} e^{-\frac{t}{RC}} \quad \tau = RC$$

#### Discharging a Capacitor

$$q_0 = C \Delta V_{\text{batt}}$$

$$q(t) = q_0 e^{-\frac{t}{RC}} \quad I(t) = -\frac{q_0}{RC} e^{-\frac{t}{RC}}$$

### Unit 12 – Magnetism

$$\vec{F}_{\text{mag}} = q \vec{v} \times \vec{B}$$

Lorentz Force:  $\vec{F} = q\vec{E} + q\vec{v} \times \vec{B}$

Radius of a particle in uniform circular motion in a magnetic field

$$R = \frac{mv}{qB} \quad \text{Cyclotron Frequency } \omega = \frac{qB}{m}$$