Edexcel Physics – 9PH0

Module 7: Electric and Magnetic Fields

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
Electric and Magnetic Fields				
Electric fields and how they are defined as *a region where a charged particle experiences a force*				
Electric field strength and how it is defined as: $$E = \frac{F}{Q}$$				
The equation: $$F = \frac{Q_1 Q_2}{4\pi\varepsilon_0 r^2}$$ for force between 2 charges				
The equation: $$F = \frac{Q}{4\pi\varepsilon_0 r^2}$$ for electric field due to a point charge				
the relation between electric field and electric potential				
The equation: $$E = \frac{V}{d}$$				
The equation: $$V = \frac{Q}{4\pi\varepsilon_0 r}$$				
Field lines and **equipotentials** to describe radial and uniform electric fields				
Capacitance and it is defined as: $$C = \frac{Q}{V}$$				

You should be able to demonstrate and show your understanding of:	Progress and understanding:			
	1	2	3	4
The equation: $W = {}^{1}/_{2}\, QV \; for \; energy \; stored \; in \; capacitor$ $W = {}^{1}/_{2}\, CV^2 \; and \; W = \frac{1}{2}\frac{Q^2}{C}$				
Discharge curves and how to interpret them, as well as the time constant RC				
CORE PRACTICAL 11: Use an oscilloscope or data logger to display and analyse the potential difference (p.d.) across a capacitor as it charges and discharges through a resistor.				
The equation(s): $Q, I, V = Q_0, I_0, V_0\, e^{-t/RC}$ and their corresponding log equations.				
The terms **magnetic flux density (B), flux (ϕ) and flux linkage (Nϕ)**				
The equation: $F = Bqv \sin\theta$ and **Fleming's left-hand rule** $F = BIl \sin\theta$ and **Fleming's left-hand rule**				
The factors affecting the e.m.f. induced in a coil when there is relative motion between the coil and magnet				
The factors affecting the e.m.f. induced in a coil when there is a change in current in another coil linked to the primary coil				
Lenz's law to predict the direction of in induced e.m.f. and how the prediction relates to the conservation of energy				
Faraday's law to determine the magnitude of an induced e.m.f. and use the equation: $E = \frac{-d(N\phi)}{dt}$				
The terms **frequency, period, peak value and root-mean-square value** when applying them to alternating currents and potential differences				
How to use the equationms: $V_{rms} = \frac{V_0}{\sqrt{2}} \; and \; I_{rms} = \frac{I_0}{\sqrt{2}}$				