

4. (a) Define the magnetic field \mathbf{B} in terms of the Lorentz force. [2]
(b) State Ampère's law for steady currents in integral form. [2]
(c) State the Ampère-Maxwell law in differential form. [2]
5. (a) State Faraday's law of electromagnetic induction in integral form. [2]
(b) State three ways of generating an *e.m.f.* in a wire. [3]
(c) Write down an expression for the energy stored in an inductor of inductance L carrying a current I . [1]
6. (a) Write down an expression for the energy stored in a capacitor of capacitance C carrying a charge Q . [1]
(b) What is the power dissipated in an ideal capacitor? [1]
(c) What is the power dissipated in an ideal resistor? [1]
(d) Define complex impedance, impedance and phase angle for a two terminal A.C. circuit. [3]



$I = \int$

10

$B = \mu_0$

$\mu_0 + \frac{d\Phi}{dt}$

$\mu_0 + \mu_0 \frac{d\Phi}{dt}$