

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]



10

For $B = \mu_0$

$\mu_0 + \frac{\mu_0}{\epsilon_0}$

$\mu_0 + \epsilon_0 \frac{d\Phi}{dt}$

$I = 3$