Chapter I

Capacitors

I1 Charge and Energy stored on a Capacitor

$^{10}/_{12}$

Complete the questions in the table:

	Capacitance	Voltage /V	Charge /C	Energy /J
I1.1	100 μF	6.0	(a)	(b)
I1.2	(a)	12.0	(b)	0.0010
I1.3	(a)	240	1.6×10^{-4}	(b)
I1.4	10 nF	(a)	1.6×10^{-4}	(b)

I1.5 Calculate the capacitance of a capacitor needed in a back up power supply if it needs to store 0.24 J of electrical energy when connected to a 12 V power supply.

I1.6 When a metal strip is rubbed on a 5000 V terminal, it gains 6.0 nC of charge. Calculate the effective capacitance of the strip.

I1.7 A 2200 μF capacitor needs to be able to supply an average current of 2.0 mA for five minutes. Calculate the charge needed, and therefore the operating voltage which has to be employed.

I1.8 A mystery capacitor can store 3.0 J of energy when connected to a 10 V supply. How much energy can it store when connected to a 5.0 V supply?