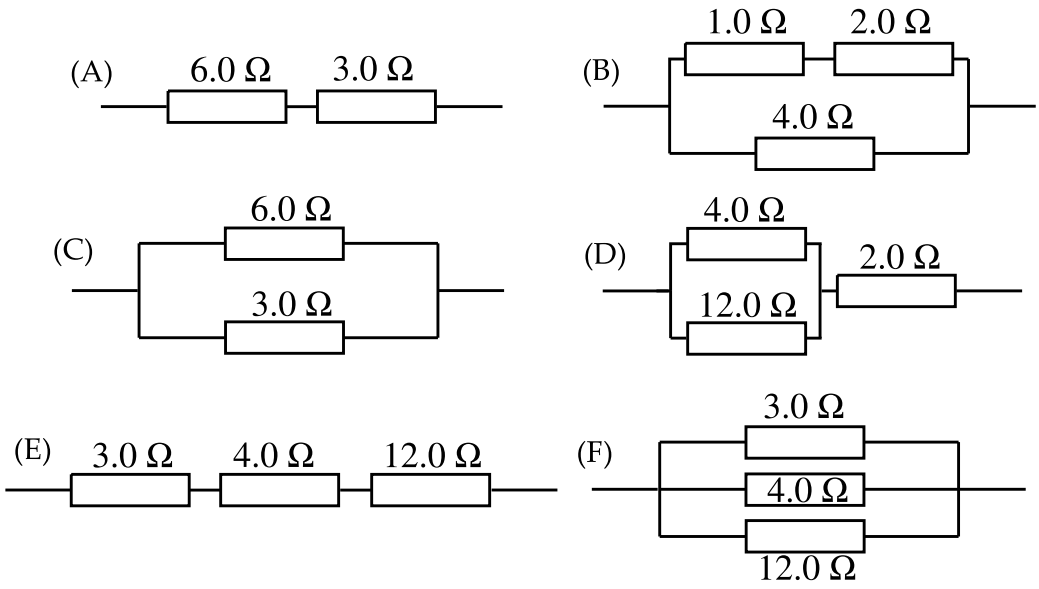
Chapter C

Electric Circuits

$^{9}/_{12}$

C1 Combinations of Resistors



What is the resistance of labelled combination?

C1.1 a) A b) B

C1.2 a) C b) D

C1.3 a) E b) F

Resistivity

Complete the questions in the table:

Length /m	Wire thickness	Resistivity /Ω m	Resistance /Ω
68	cross sectional area: 2.1×10^{-6} m^2	1.5×10^{-8}	C1.4
C1.5	cross sectional area: 0.50×10^{-6} m^2	4.9×10^{-7}	15
1.0	1.0 mm radius	4.9×10^{-7}	C1.6
15 000	1.0 cm diameter	1.5×10^{-7}	C1.7

C1.8 Conventional domestic 13 A sockets are connected with copper cables with a cross sectional area of 2.5 mm^2. Copper has a resistivity of 1.5×10^{-8} Ω m. What is the resistance of 20 m of cable?

C1.9 A high voltage wire for transmission of electricity across the country is made of 10 aluminium wires (resistivity $= 2.5 \times 10^{-8}$ Ω m) wound together with 15 copper wires (resistivity of 1.5×10^{-8} Ω m). If all of the wires have a radius of 2.0 mm, calculate the overall resistance of 20 km of cable. (The aluminium is there to give strength to the cable.)