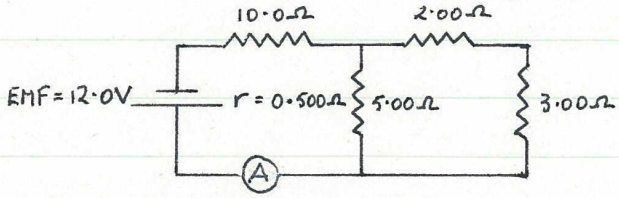
YEAR 11 PHYSICS
SEMESTER 2 TEST 6.

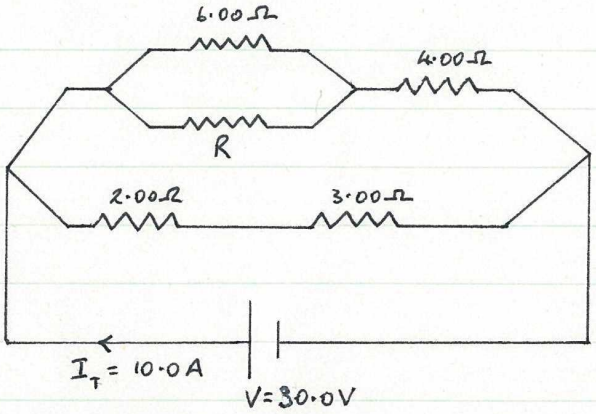
1. A wire has a resistance of 20·0Ω. If the wire is drawn out to three times its original length and its diameter is halved, what is its new resistance? (3)

2. From the circuit diagram shown, calculate:



(a) the total resistance.
(b) the current that flows.
(c) the terminal voltage. (5)

3.



Given the total current in the circuit at left is 10·0A, calculate:
(a) the current in the 2·00Ω resistor.
(b) the potential drop across the 4·00Ω resistor
(c) the value of the resistance R. (5).

4. An electric kettle has a heating element of resistance 24·0 Ω and operates at 10·0A at 2.40×10^2 V. It is used to heat 0·900 kg of water from 20·0°C to boiling point. Given the kettle is made out of 0·450 kg stainless steel (specific heat = 7.20×10^2 J kg^{-1} K^{-1}), and 10·0% of the heat energy supplied is lost to the atmosphere, calculate the time taken for the kettle to boil.

($c_{water} = 4.18 \times 10^3$ J kg^{-1} K^{-1}, $L_{vaporisation\ (water)} = 2.25 \times 10^6$ J kg^{-1}). (5)

5. Define the following terms:
(a) current
(b) potential difference. (2)

6. Draw a diagram to show how five 3·00Ω resistors can be joined to give an overall resistance of 7·00Ω. (2)

TOTAL: 22