13 A filament lamp is marked 12 V 60 W. The filament is made from a long metal wire with a diameter of 0.25 mm. The metal has a resistivity of $5.6 \times 10^{-8}\,\Omega$m when the wire is at normal operating temperature.

(a) Calculate the length of the wire in the filament.

(4)

Length of wire = ...

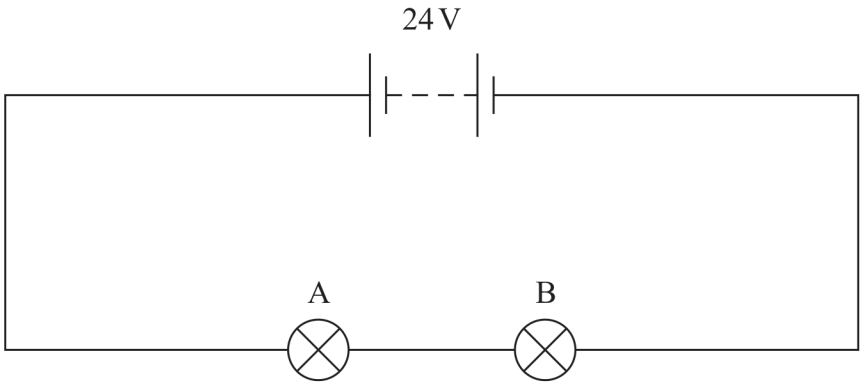
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(b) A student has two filament lamps. Lamp A is marked 12 V 60 W and lamp B is marked 12 V 30 W. The student sets up the circuit shown.



The student states that both lamps will operate normally.

Evaluate whether the student's statement is correct.

(3)

(Total for Question 13 = 7 marks)