6 **(a)** **(i)** On Fig. 6.1, sketch the *I*–*V* characteristic of a filament lamp.

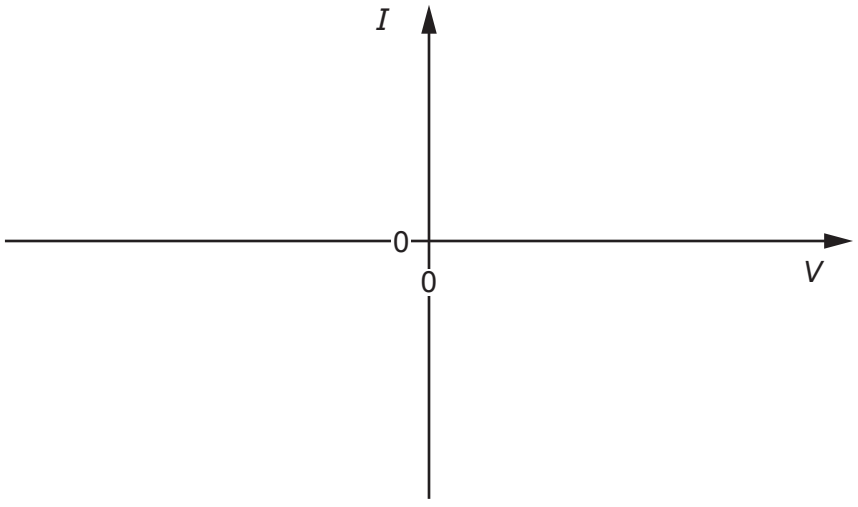

Fig. 6.1

[2]

(ii) Explain the shape of the line in **(a)(i)**.

.....

.....

.....

..... [3]

(b) A conducting wire has length 5.8 m and cross-sectional area $3.4 \times 10^{-8}\,m^2$. The resistivity of the metal of the wire is $5.6 \times 10^{-8}\,\Omega m$.

Calculate the resistance of the wire.

resistance = ... Ω [2]

(c) A resistor of resistance R is placed in a circuit with a cell of negligible internal resistance, two switches S_1 and S_2, a second resistor of resistance $2R$ and three ammeters X, Y and Z. The circuit is shown in Fig. 6.2.

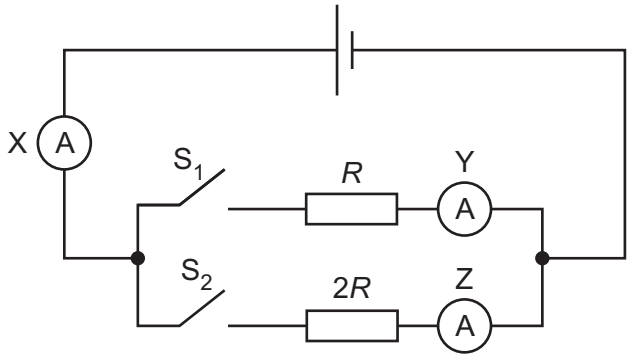

Fig. 6.2

The reading on X is 1.0A when S_1 is open and S_2 is closed.

Complete Table 6.1.

Table 6.1

position of switches		ammeter readings		
S_1	S_2	reading on X/A	reading on Y/A	reading on Z/A
open	open	0	0	0
open	closed	1.0		
closed	open			
closed	closed			

[4]

[Total: 11]