6 A solar cell generates an electromotive force (e.m.f.) when solar radiation is incident on its surface.

A variable resistor R is connected across the terminals of the cell, as shown in Fig. 6.1.

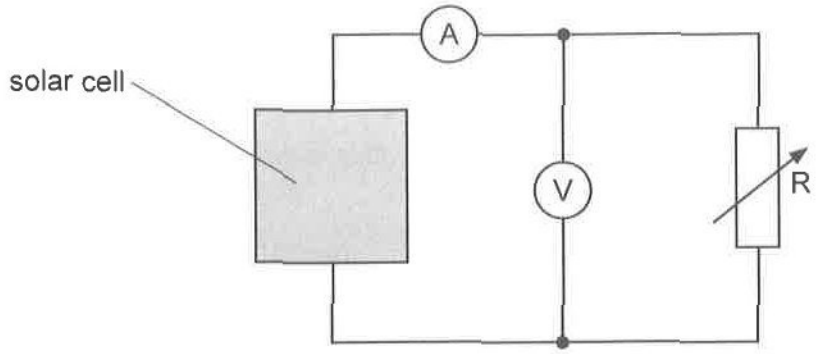

Fig. 6.1

For one particular intensity of solar radiation incident on the cell, the resistance of the resistor R is varied.
The variation with potential difference V of the current I is shown in Fig. 6.2.

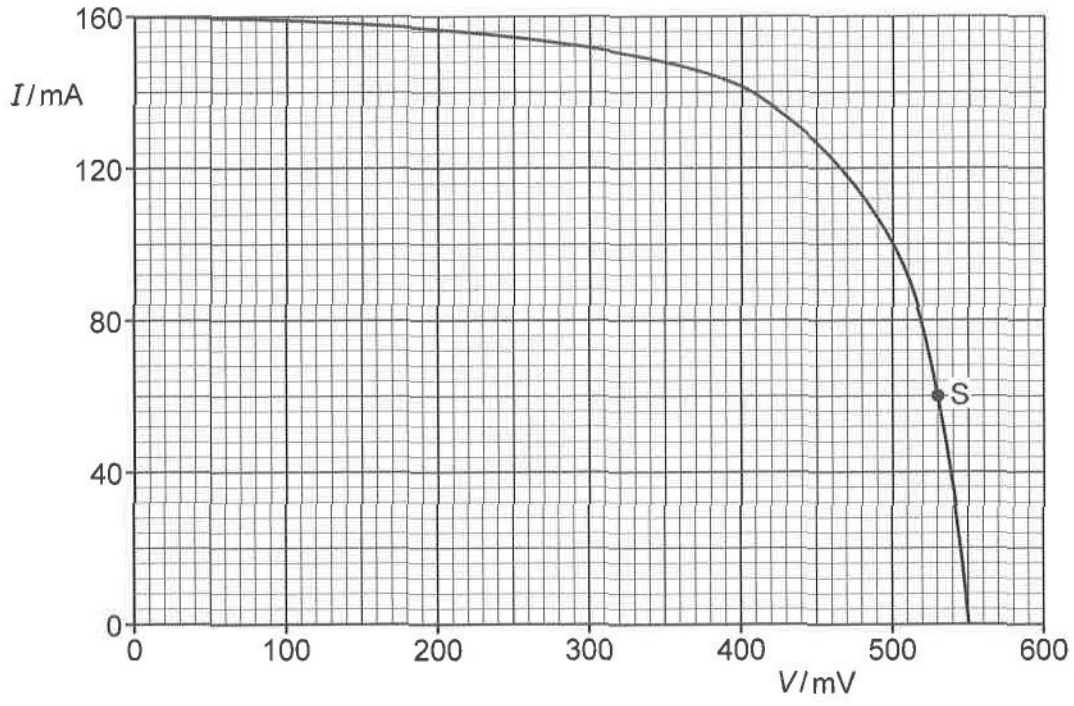

Fig. 6.2

(a) (i) At one value of resistance, the current and potential difference are given at point S on the graph of Fig. 6.2.

On Fig. 6.2, shade the area that represents the power dissipated in the resistor for point S. [2]

(ii) On Fig. 6.2, mark with the letter M the point on the curve that would give rise to maximum power in the resistor. [1]

(b) For this light intensity incident on the solar cell, the current in the resistor R is 100 mA.

Use data from Fig. 6.2 to determine, for the current of 100 mA:

(i) the resistance of resistor R

resistance = ... Ω [2]

(ii) the power dissipation in resistor R

power = ... W [2]

(iii) the internal resistance of the solar cell.

internal resistance = ... Ω [2]

[Total: 9]