

- 5 A 240V power supply S with negligible internal resistance is connected to four resistors, as shown in Fig. 5.1.

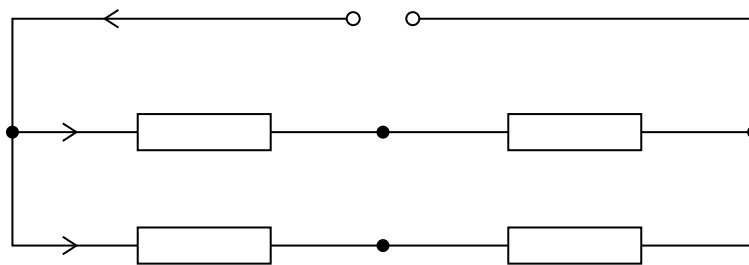


Fig. 5.1

Two resistors of resistance $550\ \Omega$ and $950\ \Omega$ are connected in series across S. Two resistors of resistance $350\ \Omega$ and R are also connected in series across S.

The current supplied by S is $0.40\ \text{A}$.

Currents I_1 and I_2 in the circuit are shown in Fig. 5.1.

(a) Calculate

(i) current I_1 ,

$$I_1 = \dots\dots\dots \text{ A [2]}$$

(ii) resistance R ,

$$R = \dots\dots\dots \Omega [2]$$

(iii) the ratio

$$\frac{\text{power transformed in resistor of resistance } 350\ \Omega}{\text{power transformed in resistor of resistance } 550\ \Omega}.$$

$$\text{ratio} = \dots\dots\dots [2]$$

(b) Two points are labelled A and B, as shown in Fig. 5.1.

(i) Calculate the potential difference V_{AB} between A and B.

$V_{AB} = \dots\dots\dots$ V [2]

(ii) The resistance R is increased.

State and explain the effect on V_{AB} .

$\dots\dots\dots$
 $\dots\dots\dots$
 $\dots\dots\dots$ [1]