

31 There is a potential difference V across a resistor of resistance R . The current in the resistor is I .

Which equation gives the power P dissipated by the resistor?

- A** $P = V^2 I$ **B** $P = \frac{V^2}{I}$ **C** $P = V^2 R$ **D** $P = \frac{V^2}{R}$

A-Level Physics: **w25 12**

32 The current in a resistor of constant resistance is 8.0 mA. The power dissipated by the resistor is P .

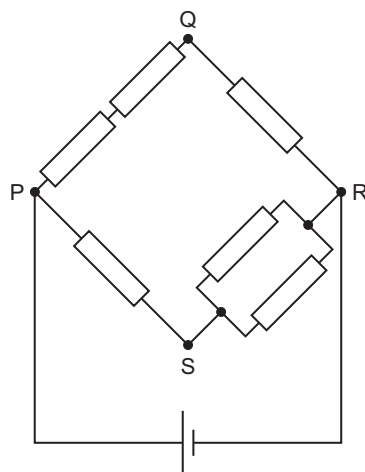
The current in the resistor is increased to 12.0 mA.

What is the new power dissipated by the resistor?

- A** $0.44P$ **B** $0.67P$ **C** $1.5P$ **D** $2.3P$

A-Level Physics: **s25 11**

34 The diagram shows six identical resistors connected in a circuit.



In which branch of the circuit is the most power dissipated?

- A** PQ **B** QR **C** RS **D** SP

A-Level Physics: **s25 14**

30 What is equivalent to one volt?

- A** one coulomb per second
B one joule per coulomb
C one joule per second
D one joule second per coulomb squared

6 (a) Define electric potential difference across a component.

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 [1]

(b) A circuit contains four resistors and a battery of electromotive force (e.m.f.) 8.0 V with negligible internal resistance. When the variable resistor has resistance R , the currents in the circuit are 0.030 A, I_1 and I_2 , as shown in Fig. 6.1.

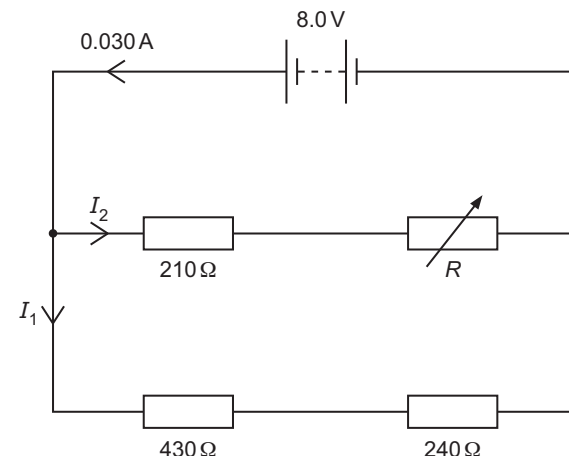


Fig. 6.1

(i) Determine the charge passing through the battery in a time of 4.0 minutes.

charge = C [2]

(ii) Calculate I_1 .

I_1 = A [2]

(iii) Calculate I_2 .

$$I_2 = \dots\dots\dots \text{ A [1]}$$

(iv) Determine R .

$$R = \dots\dots\dots \Omega \text{ [2]}$$

- (c) The variable resistor in (b) is fitted with a scale so that its resistance can be accurately determined.
The resistor of resistance 240Ω is now replaced by a new resistor X of unknown resistance. A galvanometer is connected as shown in Fig. 6.2.

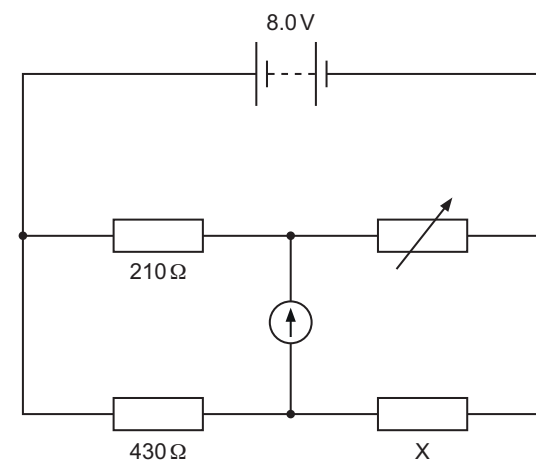


Fig. 6.2

With reference to ratios of resistances, explain how this circuit can be used to determine the resistance of X.

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 [2]

[Total: 10]