SL Physics: Circuits More Practice **NAME**_____

1. One electronvolt is equal to

A. 1.6×10^{-19} C.

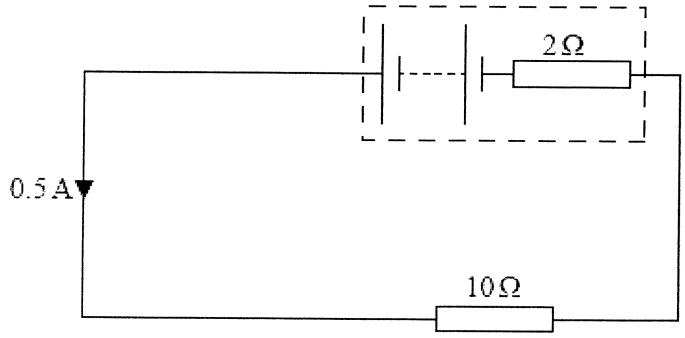
B. 1.6×10^{-19} J.

C. 1.6×10^{-19} V.

D. 1.6×10^{-19} W.

(Total 1 mark)

2. A battery of internal resistance 2 Ω is connected to an external resistance of 10 Ω. The current is 0.5 A.



What is the emf of the battery?

A. 1.0 V

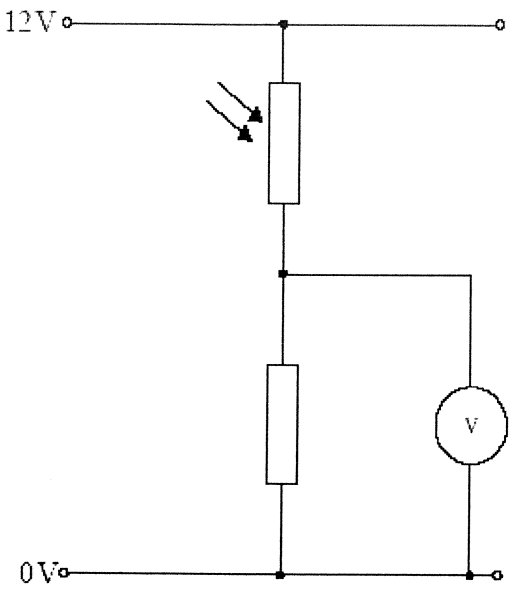
B. 5.0 V

C. 6.0 V

D. 24.0 V

(Total 1 mark)

3. In the circuit below, which of the following will cause the greatest increase in the reading of the voltmeter?



A. An increase in temperature

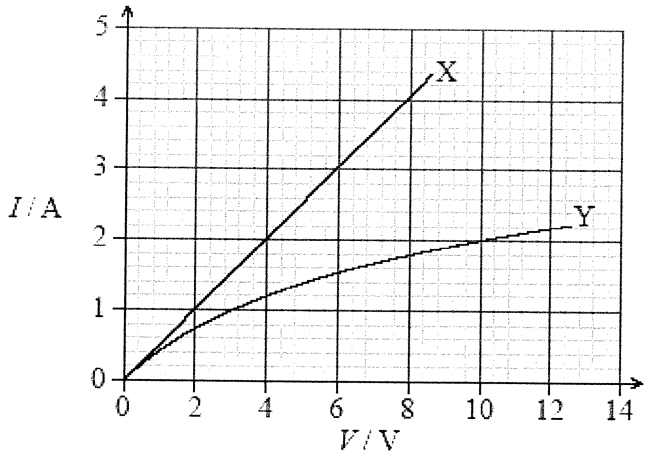
B. An increase in light intensity

C. A decrease in temperature

D. A decrease in light intensity

(Total 1 mark)

4. The graph shows the *I*–*V* characteristics of two resistors.



When resistors X and Y are connected in series, the current in the resistors is 2.0 A. What is the resistance of the series combination of X and Y?

A. 7.0 Ω

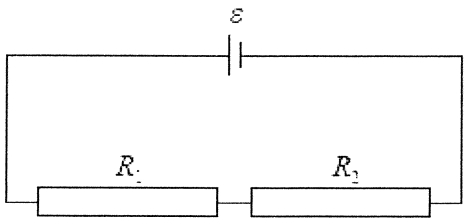
B. 1.3 Ω

C. 1.1 Ω

D. 0.14 Ω

(Total 1 mark)

5. Two resistors, of resistance R_1 and R_2, are connected in series with a cell of emf ε and negligible internal resistance.



Which expression gives the potential difference across the resistor of resistance R_1?

A. $\left(\frac{R_1}{R_1 + R_2}\right)\varepsilon$

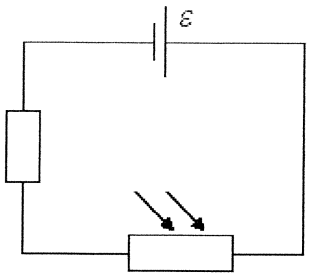
B. $\left(\frac{R_1 + R_2}{R_1}\right)\varepsilon$

C. $\left(\frac{R_2}{R_1 + R_2}\right)\varepsilon$

D. $\left(\frac{R_1 + R_2}{R_2}\right)\varepsilon$

(Total 1 mark)

6. The circuit shows a light-dependent resistor (LDR) in series with a resistor and a cell. The emf of the cell is ε. The internal resistance of the cell is negligible.



When light shines on the LDR, the potential difference across the resistor will

A. stay the same.

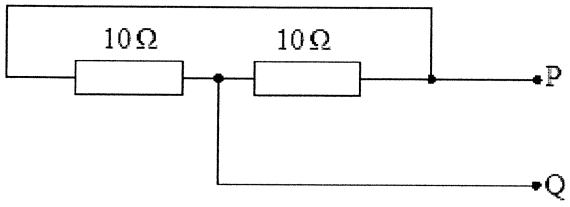
B. decrease.

C. increase but always be less than ε.

D. increase and exceed ε.

(Total 1 mark)

7. Two 10 Ω resistors are connected as shown.



What is the resistance across PQ?

A. 0 Ω

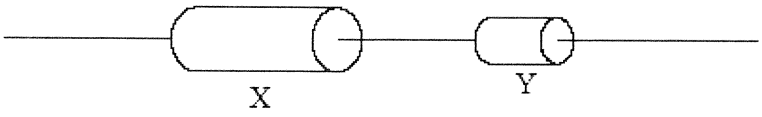
B. 5 Ω

C. 10 Ω

D. 20 Ω

(Total 1 mark)

8. Two resistors, made of the same material, are connected in series to a battery. The length of resistor X is twice that of resistor Y, and X has twice the cross-sectional area of Y.



Which of the following gives $\frac{\text{resistance of X}}{\text{resistance of Y}}$?

A. $\frac{1}{4}$

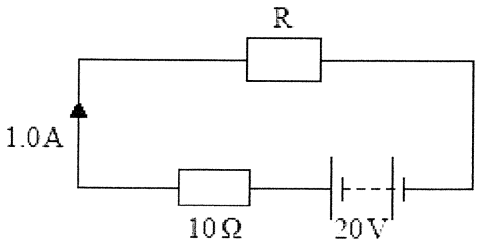
B. $\frac{1}{2}$

C. 1

D. 4

(Total 1 mark)

9. The circuit shows a resistor R connected in series with a battery and a resistor of resistance 10 Ω. The emf of the battery is 20 V and it has negligible internal resistance. The current in the circuit is 1.0 A.



Which of the following is the resistance of R?

A. 1.0 Ω

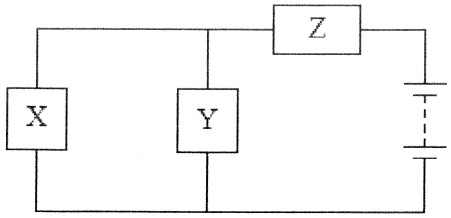
B. 2.0 Ω

C. 10 Ω

D. 20 Ω

(Total 1 mark)

10. Three identical resistors are connected to a battery as shown.



Which of the following is a correct statement?

A. The current through X is greater than that through Z.

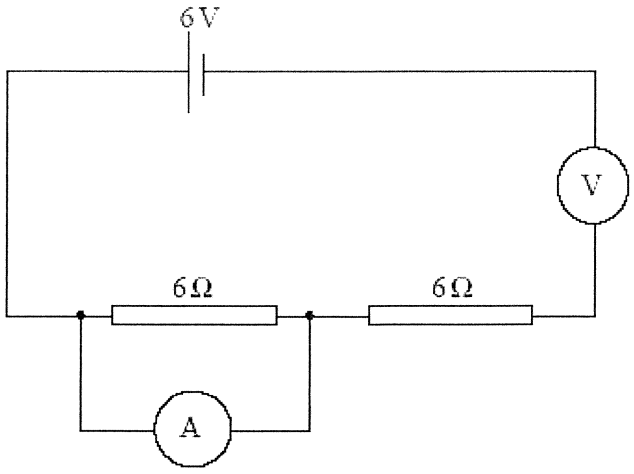
B. The potential difference across Z is greater than that across Y.

C. The potential difference across resistor X and Y together is the same as that across Z.

D. The current through Z is less than the total current through X and Y.

(Total 1 mark)

11. Two 6 Ω resistors are connected in series with a 6 V cell. A student **incorrectly** connects an ammeter and a voltmeter as shown below.



The readings on the ammeter and on the voltmeter are

	Ammeter reading / A	Voltmeter reading / V
A.	0.0	0.0
B.	0.0	6.0
C.	1.0	0.0
D.	1.0	6.0

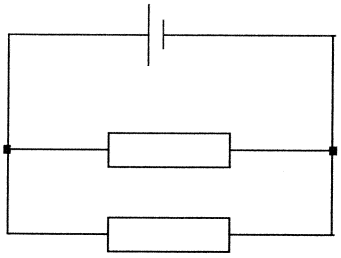
(Total 1 mark)

12. Which of the following correctly gives the resistance of an ideal ammeter and resistance of an ideal voltmeter?

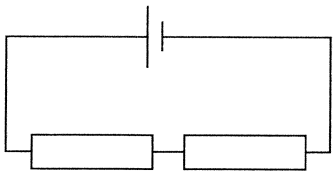
	Ammeter	Voltmeter
A.	infinite	infinite
B.	zero	zero
C.	zero	infinite
D.	infinite	zero

(Total 1 mark)

13. In the circuits below the cells have the same emf and zero internal resistance. The resistors all have the same resistance.



circuit X



circuit Y

Which of the following gives the ratio $\frac{\text{power dissipated in X}}{\text{power dissipated in Y}}$?

A. $\frac{1}{4}$

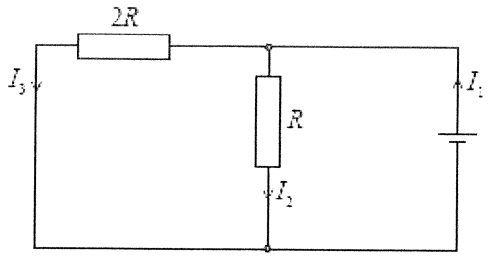
B. $\frac{1}{2}$

C. 2

D. 4

(Total 1 mark)

14. In the circuit shown below, the cell has negligible internal resistance.



Which of the following equations is correct?

A. $I_1 = 2I_2$

B. $I_1 = 2I_3$

C. $I_2 = 2I_3$

D. $I_3 = 2I_1$

(Total 1 mark)

1-5 B, C, B, A, A
6-10 C, B, C, C, B
11-14 B, C, D C