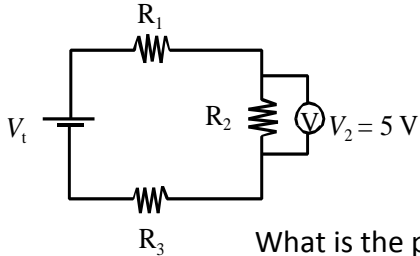


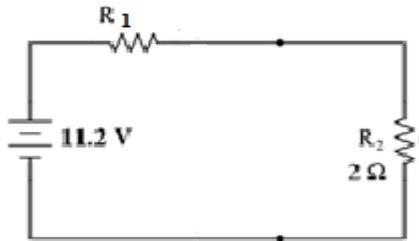
Enriched Circuit #2 Worksheet

1. The following electric circuit consists of a power source, three identical resistors (R_1 , R_2 and R_3) and a voltmeter V . The potential difference (voltage), V_2 , across R_2 is 5 V.

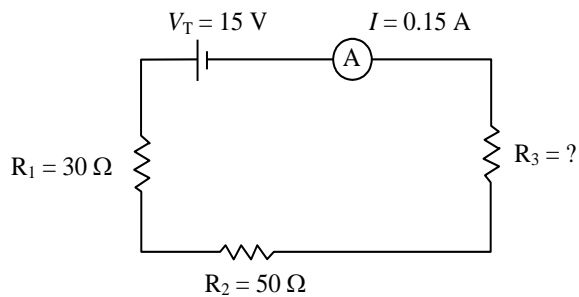


What is the potential difference (voltage), V_t , across the terminals of the power source?

2. If the current intensity of the circuit is 0.035 A, what is the resistance for ' R_1 '?



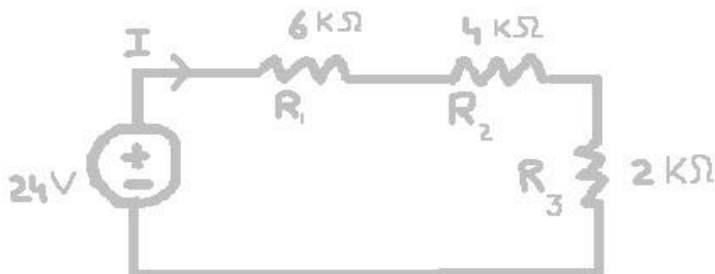
3. The following electric circuit consists of a power supply, an ammeter A and three resistors (R_1 , R_2 and R_3). The voltage across the power supply is 15 V, and the ammeter reads 0.15 A.



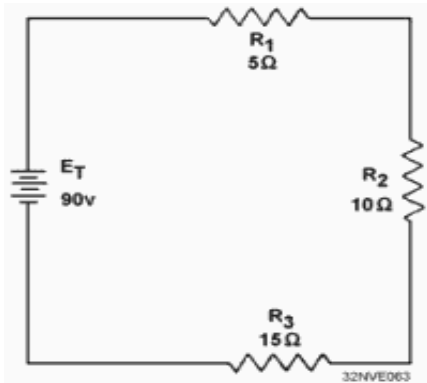
What is the value of R_3 ?

- A) $20\ \Omega$ B) $33\ \Omega$ C) $80\ \Omega$ D) $100\ \Omega$

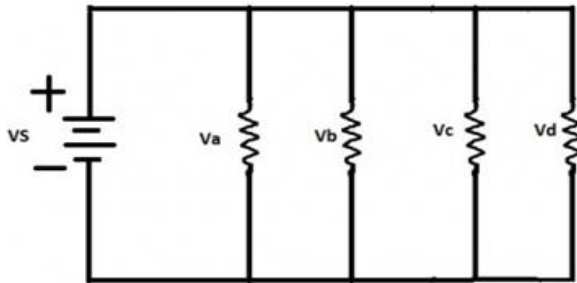
4. What is the current intensity of the circuit? To convert a $\text{k}\Omega$ to an Ω , multiply by 1 000.



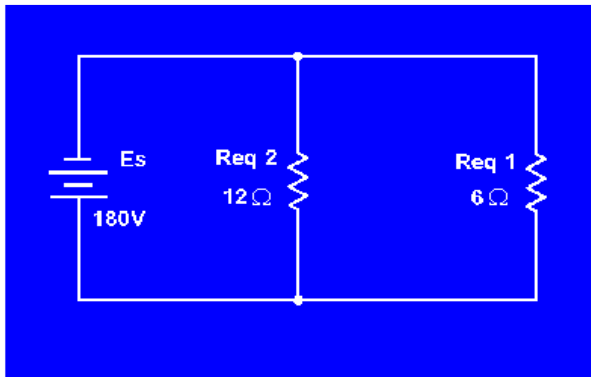
5. What is the potential difference for R_3 ?



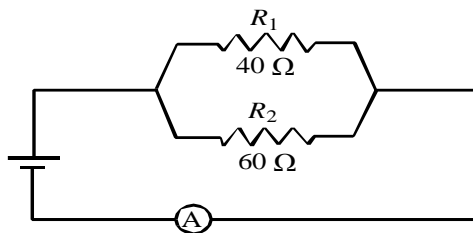
6. All resistors are of equal strength. The voltage for V_a is 25 V and the current going through V_a is 0.55 A. What is the equivalent resistance of the circuit?



7. What is the current intensity coming from the power source?

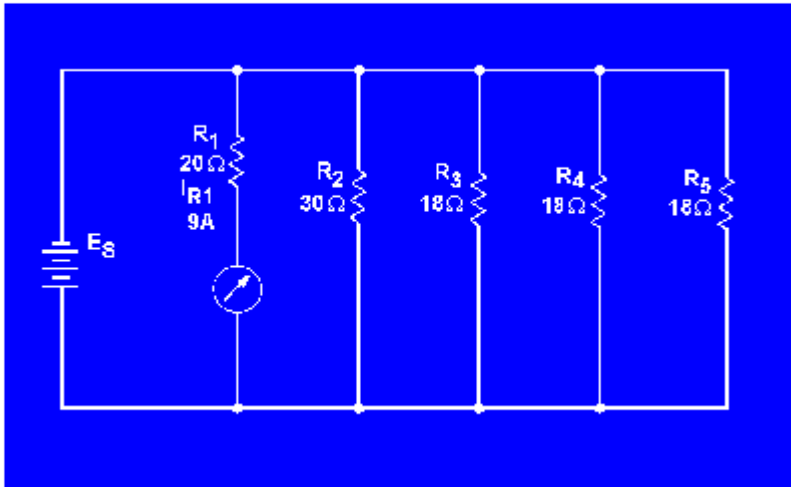


8. The following circuit consists of a power supply, two resistors (R_1 and R_2) and an ammeter.

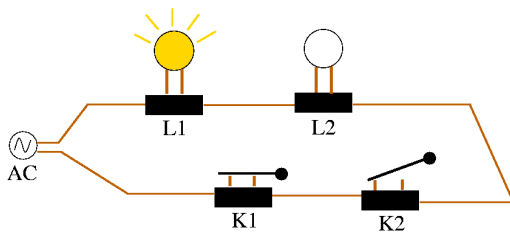


The current through resistor R_1 is 2 A. What is the current indicated by the ammeter?

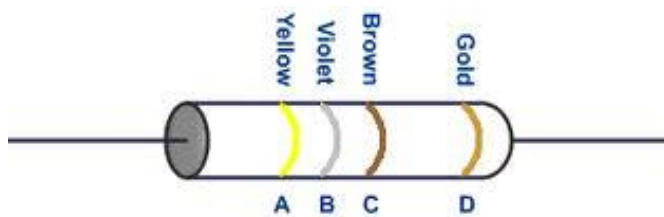
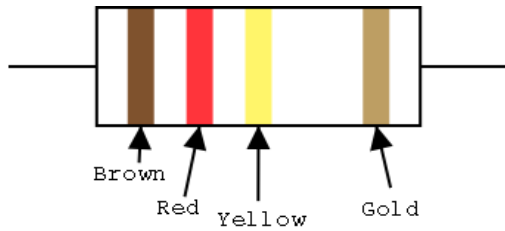
9. What is the current intensity for R_3 and the current intensity from the power source?



10. What is wrong with the picture below?



11. What are the values of the resistors?



12. Identify the colours associated with the resistors if they have the following resistances.

a) $23\ 000\ \Omega \pm 20\%$

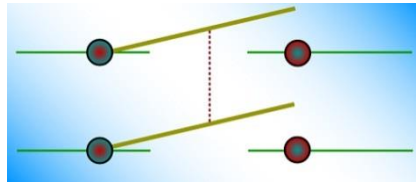
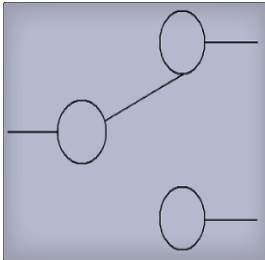
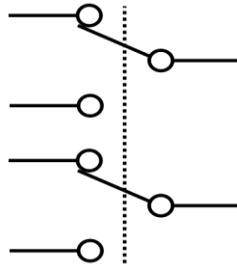
b) $44\ \Omega \pm 10\%$

c) $180\ \Omega \pm 5\%$

13. Match the following terms with the pictures below:

- a) single pole-single throw
- b) single pole-double throw

- c) double pole-single throw
- d) double pole-double throw



14. Name the appropriate type of switch for the following functions:

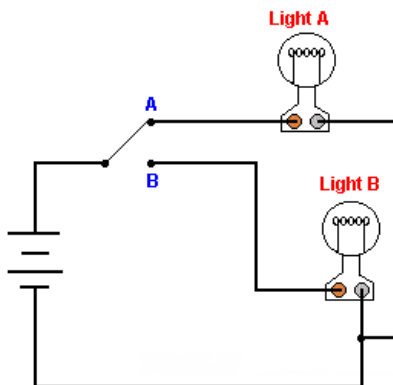
- a) opening or closing two contacts at once and contact has one path
- b) opening one or the other of two circuits
- c) opening one or the other of one circuit

15. What positions do the switches have to be in for the light bulb to receive power?



16. Consider the circuit diagram below.

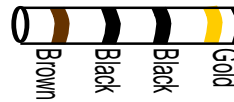
- a) Name the switch.
- b) How must the switch be placed so that light bulb A comes on?
- c) Can light bulb A ever be on at the same time as light bulb B?



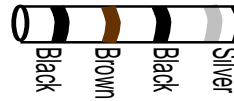
17. Nicolas has decided to participate in the *Engineering Challenge*. This year he plans to build a racecar that can move around obstacles. He needs a resistor to slow down the motor. He asks the laboratory technician for a resistor offering a resistance between $8\ \Omega$ and $12\ \Omega$. She offers him the four resistors below.

Which of the following resistors should Nicolas use?

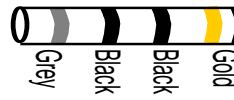
A) Resistor 1:



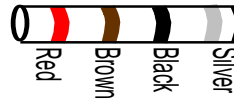
B) Resistor 2:



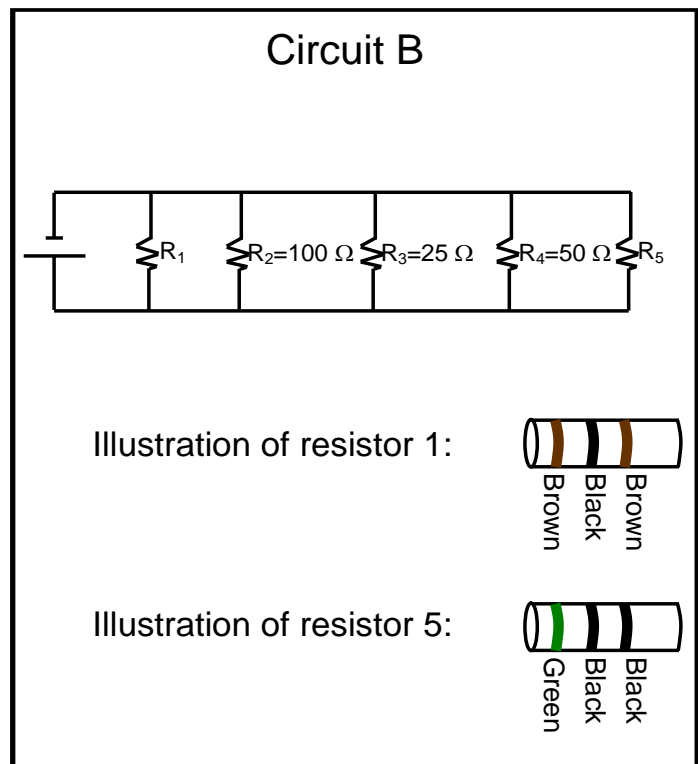
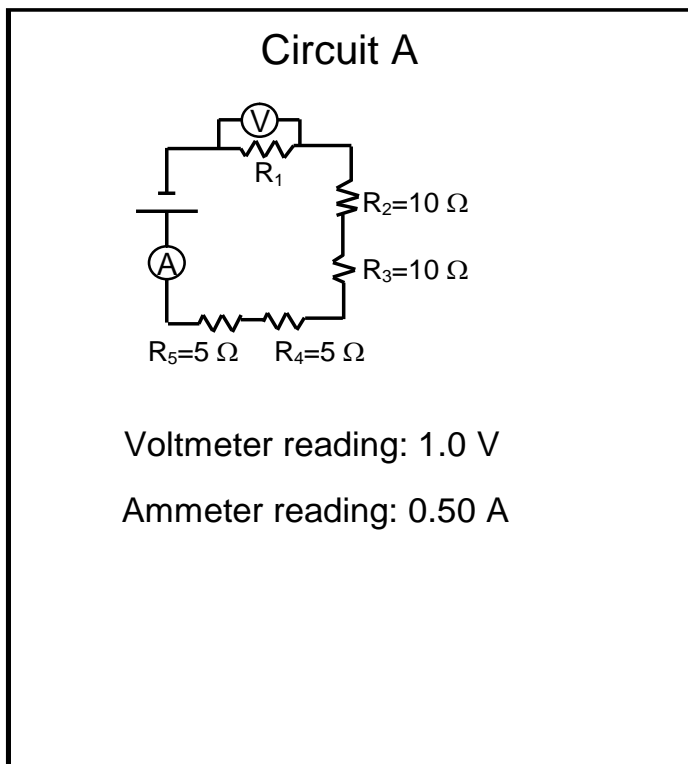
C) Resistor 3:



D) Resistor 4:



18. Refer to the illustration of Circuit A and Circuit B in Figure 4 below. Which of the two circuits (Circuit A or Circuit B) has the greatest resistance?



19. Your friend wants to add some electrical accessories to the circuit of his automobile. The circuit must supply 4 pieces of equipment : a de-mister (M), a small pump (M) and 2 bulbs. Each item can function with a 6 V or a 12 V power supply.

The car's circuits provide a maximum of 12 volts.

He proposes two ways of connecting the equipment.

DIAGRAM A

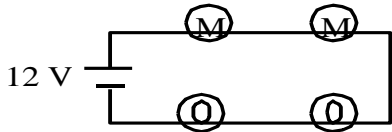
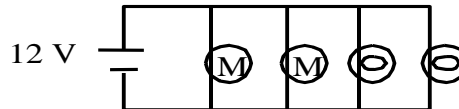


DIAGRAM B



Which diagram must he choose for each item to function properly?
Justify your answer.

20. Which switch must be closed for the doorbell to ring in the circuit below?

