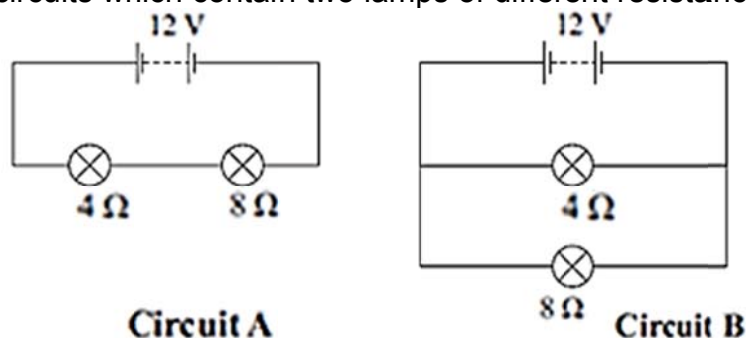


## SCIENCE: PHYSICS 90191 ELECTRICITY: CIRCUITS

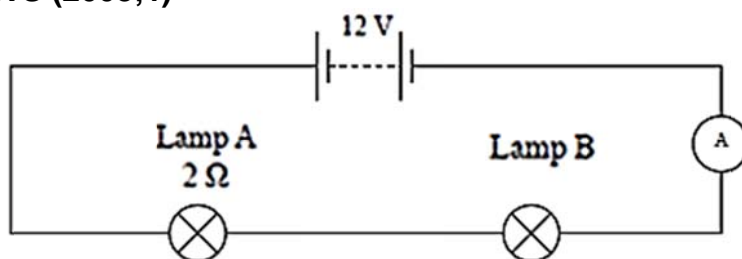
### ELECTRICAL CIRCUITS (2009;1)

Study the following two circuits which contain two lamps of different resistance.



When observed, the brightness of the two lamps in each circuit is not the same. Explain why the voltage for the  $4\ \Omega$  lamp in circuit A is lower than the voltage for the  $4\ \Omega$  lamp in circuit B. A calculation is NOT required.

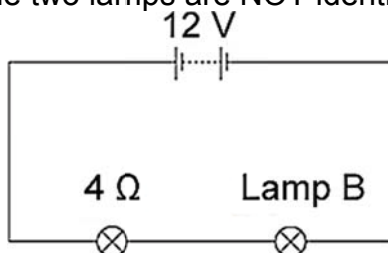
### ELECTRICAL CIRCUITS (2008;1)



The circuit above contains two lamps which are not the same. The current was measured and found to be 2 A. Lamp B glows more brightly than lamp A. A third lamp, identical to lamp A, is added in series to this circuit. Explain what effect this additional lamp has on the total current and resistance of the circuit.

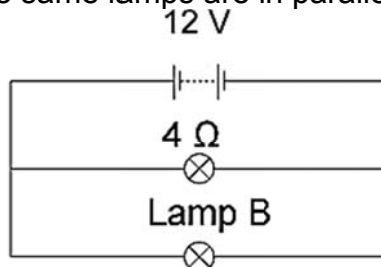
### ELECTRICITY (2007;3)

Study the circuit diagram below. The two lamps are NOT identical.



- (a) The  $4\ \Omega$  lamp has a voltage of 4.8 V across it. Describe how the brightness of lamp B compares with the  $4\ \Omega$  lamp.

The circuit is now altered so that the same lamps are in parallel.

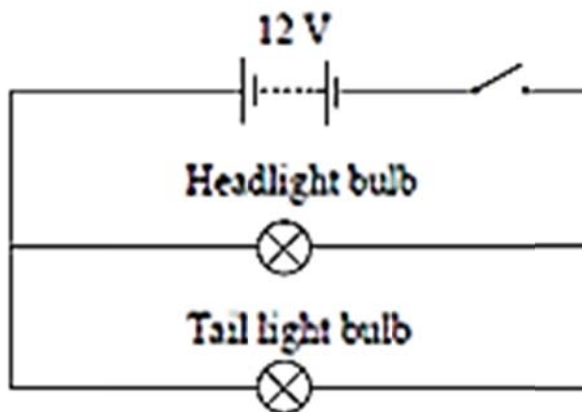


- (b) On the diagram above, draw an ammeter in the correct place to record the total current supplied by the power supply.
- (c) When this ammeter is placed in the circuit, a reading of 5 A is recorded. Explain why the current is larger in the parallel circuit than the series circuit.

### TEO'S MOTORBIKE LIGHTS (2006;3)

Teo has bought a second-hand motorbike.

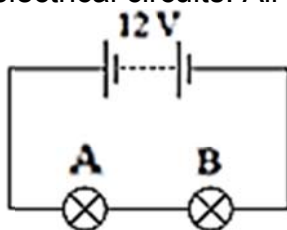
The circuit diagram below represents the lighting circuit for the motorbike.



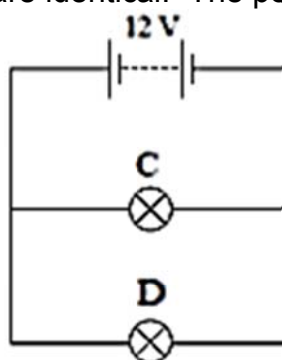
- What is the name given to this arrangement of bulbs in a circuit?
- Explain ONE reason why the bulbs would be arranged this way on a motorbike.
- State the voltage across the tail light when the switch is closed.
- Teo discovers that the headlight bulb is broken. Describe the effect of the broken headlight bulb on the tail light.

### DC ELECTRICITY (2005;3)

Refer to the following electrical circuits. All light bulbs are identical. The power supply is 12 V.



**Circuit A**



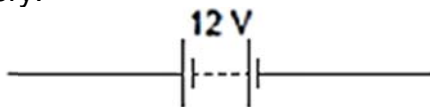
**Circuit B**

- Draw an ammeter in Circuit A to find the overall current.
- Given that the bulbs are identical, determine the voltage across bulb A.
- Referring to Circuit B, state the voltage across bulb C.
- The current is measured in bulb C's branch of the circuit and found to be 0.8 A. Determine the total current provided by the battery in circuit B.

## ELECTRICITY (2004;1)

Marty is the coach of the local women's cricket team. Marty decides to rewire the lights on the team's trailer. He knows that the lights need to be wired in parallel.

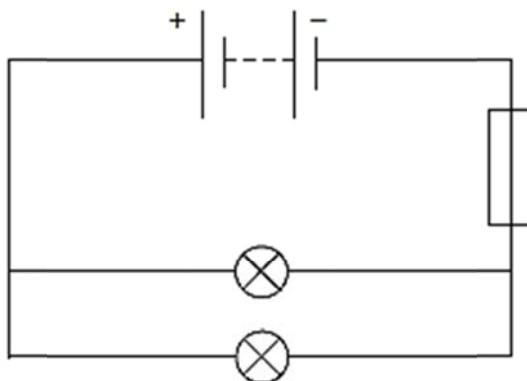
- (a) Complete the following circuit diagram to show the two light bulbs in parallel to each other, connected to the 12 V battery.



- (b) Marty placed a voltmeter across one of the bulbs in the circuit. What would be the voltage reading?  
(c) Discuss the advantages of wiring the bulbs in parallel rather than in series.

## LIGHTS (2003;1)

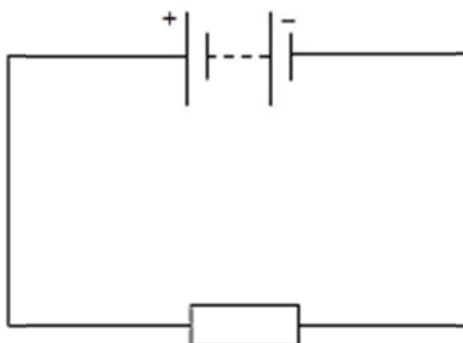
The lighting circuit below has a power supply of 12 V. Each lamp is rated at 30 W.



Discuss why the type of circuit shown in the diagram is used for lighting. You may use diagrams in your answer.

## HEATING (2003;2)

A 120 W heating coil is connected to a power supply, as shown in the circuit diagram below.



The heating coil is a resistor. On the circuit diagram above, draw a voltmeter to measure the voltage across the heating coil.