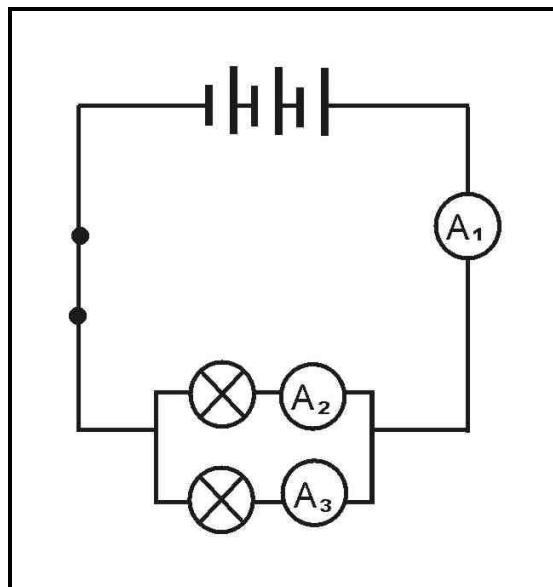


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QUESTION 1

There are four possible options for each answer in the following questions. Each question has only ONE correct answer. Choose the correct answer and write only A, B, C or D next to the question number.

- 1.1 Consider the following diagram of a circuit. The light bulbs are not necessarily identical.



The reading on A_2 will be equal to:

- A the reading on A_1
 - B half the reading on A_1
 - C the reading on A_3 minus the reading on A_1
 - D the reading on A_1 minus the reading on A_3 . (2)
- 1.2 10 C of charge passes a point in a circuit in 2 minutes. The current in the circuit is:
- A 0,083 A
 - B 0,2 A
 - C 5 A
 - D 12 A (2)

1.3 Resistors connected in series are called dividers of ...

- A current
- B charge
- C potential
- D energy

(2)

[6]

QUESTION 2

Give one word or term for each of the following descriptions. Write only the word or term next to the question number.

2.1 Negatively charged materials have (FEWER/MORE) positive charges than negative charges.

(2)

2.2 A measure of how much charge is passing a certain point in a circuit in a given amount of time.

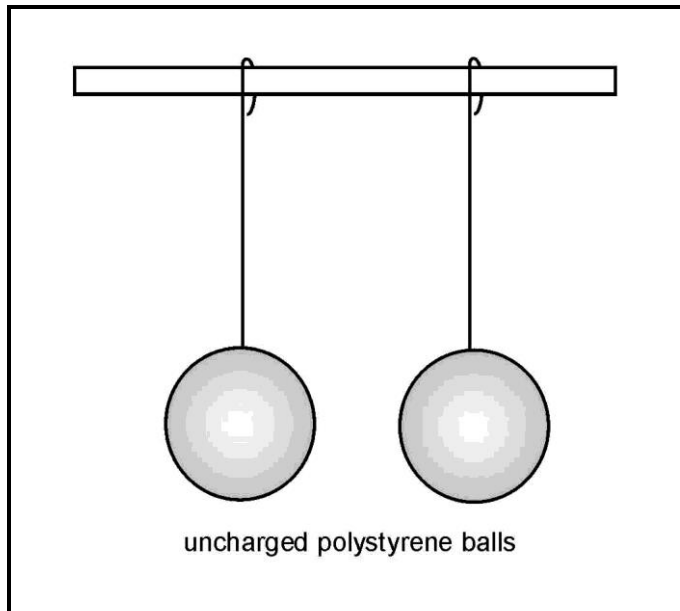
(2)

[4]

QUESTION 3

Keketso and Jacob are investigating the effect that a charged object has on a neutral object. They are given the following items:

- a Perspex rod
- a silk cloth
- two polystyrene balls wrapped in metal foil suspended together from a wooden rod.



They rub the Perspex rod with the silk cloth and the rod becomes negatively charged. They bring it close to the two balls. They observe that both of the balls are attracted to the rod.

- 3.1 Explain why the foil-covered polystyrene balls are attracted to the Perspex rod when they have a neutral charge. (4)
- 3.2 Draw a sketch to illustrate your answer in QUESTION 3.1. (3)
- 3.3 What environmental condition may cause this investigation not to work effectively? (1)

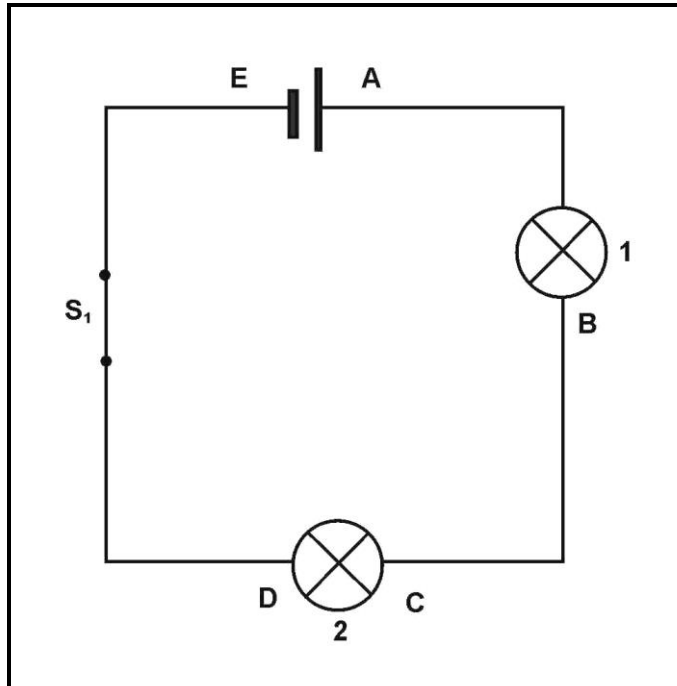
Both of the balls then touch the Perspex rod and are removed. The balls then repel each other.

- 3.4 Explain what occurred as the balls touched the rod. Be sure to explain why they repelled each other. (4)

[12]

QUESTION 4

Consider the diagram of a circuit containing one cell connected to 2 bulbs in series with a switch that is closed.

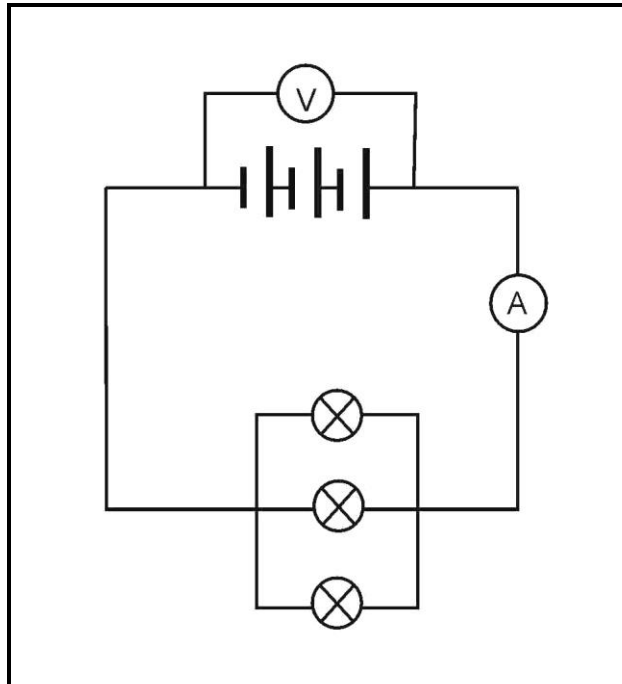


- 4.1 Copy the diagram onto your answer sheet and draw in an ammeter that measures the current through the wire at A. (1)
- 4.2 The current at A was found to be 0,6 A. What is the current at point C? (1)
- 4.3 How much current passed point C if the circuit was closed for 2 minutes? (3)
- 4.4 In the circuit diagram drawn in question 4.1, draw in a voltmeter measuring the potential difference between point A and B. (1)
- 4.5 The battery was marked as 3,0 V. The voltage across AB was found to be 1,8 V. What is the voltage across CD? Explain why V_{AB} is different to V_{CD} . (2)
- 4.6 How will the brightness of bulb 1 compare to bulb 2? Explain why this is observed. (2)

[10]

QUESTION 5

Consider the circuit below: The bulbs are identical. The resistance of the battery, ammeter and connecting wires can be ignored.



- 5.1 Calculate the voltage of all three cells if they can transfer 90 J of energy to 20 C of charge. (4)
- 5.2 What would the potential difference of each cell be? (2)
- 5.3 A charge of 30 C of charge passes a point in the main circuit in 40 s. Determine the strength of current passing through the main circuit. (4)
- 5.4 Determine the current through each individual light bulb. (2)
- 5.5 If one of the light bulbs burns out, how would the brightness of the other two bulbs be affected? Write only SHINE BRIGHTER/SHINE DIMMER. (1)

[13]

[TOTAL: 45 marks]