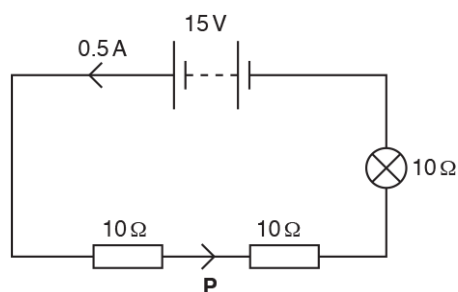


Static and Charge (H)

1. What is the current at point **P** in the circuit?

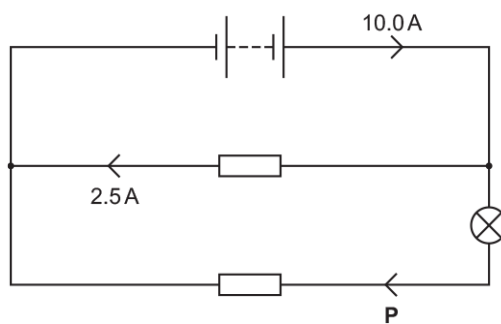


- A 0.5 A
- B 7.5 A
- C 15.0 A
- D 20.5 A

Your answer

[1]

2. Look at the circuit diagram.



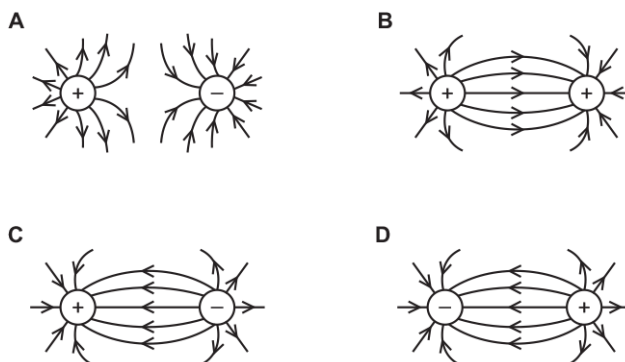
What is the current at point **P** in the circuit?

- A 2.5 A
- B 5.0 A
- C 7.5 A
- D 10.0 A

Your answer

[1]

3. Look at the field line diagrams for positive and negative charges.



Which field line diagram is correct?

Your answer

[1]

4 (a).

i. Write down the conditions needed for charge to flow through a conductor.

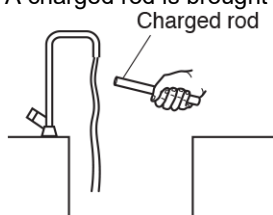
[2]

ii. Calculate the charge that flows past a point in a circuit with a 5.0 A current for five minutes.

Answer = C [4]

(b). This question is about electrostatic charges.

A charged rod is brought towards a gentle stream of water from a tap.



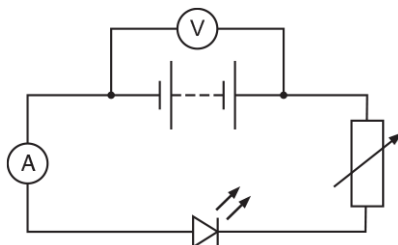
Explain how the charged rod affects the stream of water.

[3]

5 (a). A student investigates the electrical characteristics of a light emitting diode (LED).

The student builds a circuit to investigate how the current through an LED and the potential difference across it vary when the LED lights up.

Look at the circuit diagram.




i. The student has made **two** errors connecting the circuit.

Identify the errors.

1

2

[2]

ii. What is the purpose of the component  in the circuit?

[1]

(b). The student then connects the circuit correctly. He measures the current through the LED as 0.03 A when the potential difference across it is 3.0 V.

- i. Calculate the resistance of the LED.

Use the equation: potential difference = current \times resistance

Resistance = Ω [3]

- ii. Calculate the charge which flows when this LED operates for 2.5 minutes.

Charge = C [4]

- iii. Calculate the energy transferred when this LED operates for 2.5 minutes.

Use the equation: energy transferred = charge \times potential difference

Energy transferred = J [2]

6 (a). A student investigates static electricity using a plastic ruler.

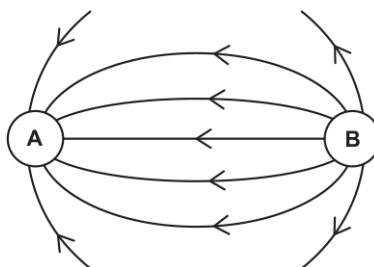
- i. Explain in terms of electrons why the plastic ruler is not normally charged.

[2]

- ii. Explain in terms of electrons why the ruler becomes charged when the student rubs it with a cloth.

----- [2]

- (b). The diagram shows the electric field between two charges, **A** and **B**.



- i. State the charges of **A** and **B**.

Use the diagram to explain your answer.

----- [3]

- ii. Describe **one** similarity between the electric field line diagram and a magnetic field line diagram.

----- [1]

END OF QUESTION PAPER