

GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

Question Set 16

1 Nina is investigating electrical circuits in the laboratory.

(a) Nina is looking for a filament lamp for her torch.

Fig. 1.1 shows a filament lamp that may be suitable.

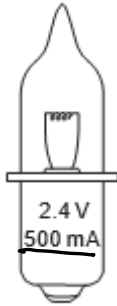
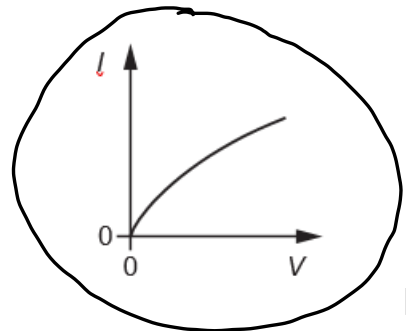
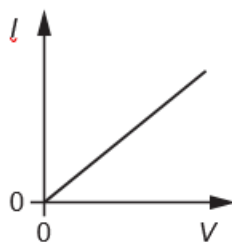
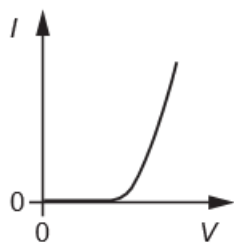


Fig. 1.1

(i) Which current against voltage graph (I - V characteristic) for a filament lamp is correct?

Put a ring around the correct answer.



[1]

(ii) Calculate the amount of charge flowing through the filament lamp when it is used for 60 s.

Use the equation: charge = current \times time

$$Q = It = 0.5 \times 60 = 30 \text{ C}$$

Charge = 30 C [3]

(iii) The base of the filament lamp has '2.4 V, 500 mA' stamped on it.

Calculate the power of the filament lamp at 2.4 V.

$$P = IV = 0.5 \times 2.4 = 1.2 \text{ W}$$

Power = 1.2 W [3]

- (b) Nina connects up the following circuit using two identical filament lamps.

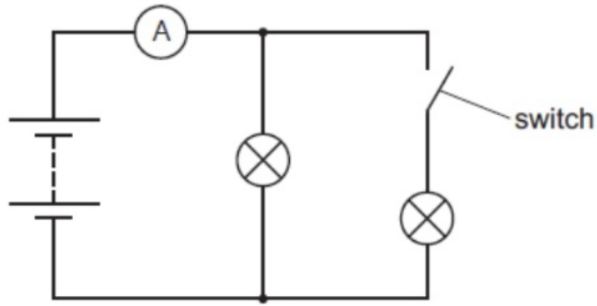


Fig. 1.2

The switch is currently open.

Explain what happens to the ammeter reading when the switch is then **closed**. [2]

The ammeter reading increases.

- (c) (i) What is the name of the electrical component that conducts current in **only one** direction?

Tick (✓) **one** box.

Diode

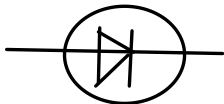
Lamp

Light-Dependent Resistor (LDR)

Thermistor

[1]

- (ii) Draw an electrical symbol for your answer to (c)(i). [1]



Total Marks for Question Set 16: 11

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