

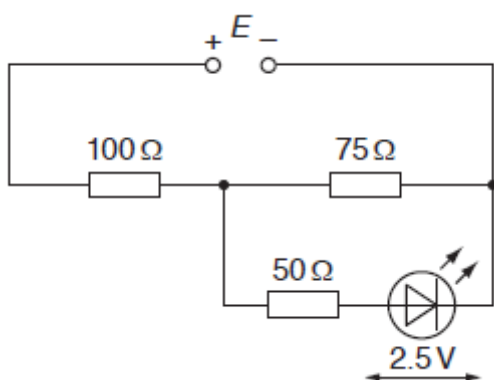


# **A Level Physics A**

**H556/02** Exploring physics

## **Question Set 26**

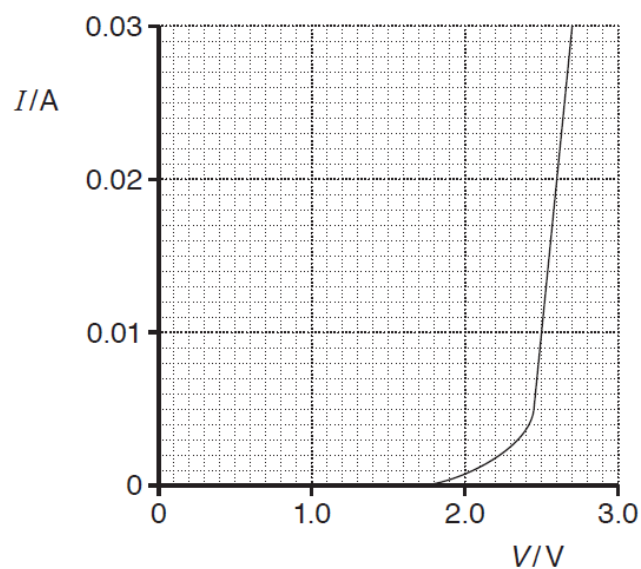
1 Fig. 19.1 shows an electric circuit.



**Fig. 19.1**

The power supply has electromotive force (e.m.f.)  $E$  and negligible internal resistance.

The resistance values of the resistors are shown in Fig. 19.1. The  $I$ - $V$  characteristic of the light-emitting diode (LED) is shown in Fig. 19.2.



**Fig. 19.2**

The potential difference (p.d.) across the LED is  $2.5\text{V}$ .

(a) Use Fig. 19.2 to show that the p.d. across the  $50\ \Omega$  resistor is  $0.50\text{V}$ .

(b) Calculate the e.m.f.  $E$  of the power supply.

$$E = \dots\dots\dots V \text{ [3]}$$

(c) The LED emits blue light of wavelength  $4.7 \times 10^{-7} \text{ m}$ .

(i) Estimate the number of blue light photons emitted from the LED per second.

$$\text{number of photons per second} = \dots\dots\dots \text{ s}^{-1} \text{ [3]}$$

(ii) The light from the LED is incident on a metal of work function  $2.3 \text{ eV}$ .

Explain, with the help of a calculation, whether or not photoelectrons will be emitted from the surface of the metal.

[2]

**Total Marks for Question Set 26: 10**

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