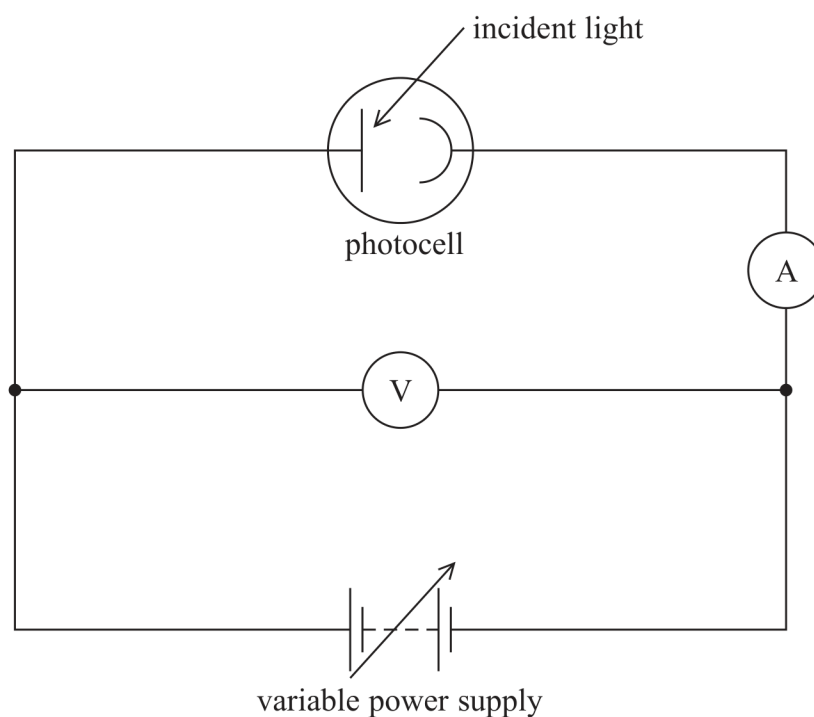


- 14 Photocells make use of the photoelectric effect. The following circuit can be used to determine the work function of a metal used in a photocell.



- (a) State what is meant by the work function of a metal.

(1)

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- (b) This photocell works with ultraviolet light but does not work with visible light.

Explain why.

(2)

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.....



(c) An experiment was carried out using this circuit. The potential difference applied to the photocell opposes the movement of the electrons through the photocell, reducing the current.

- (i) The variable power supply was initially set at 0 V and the reading on the ammeter was  $2.4 \mu\text{A}$ .

The intensity of the ultraviolet light was then increased without changing the frequency.

Explain what happened to the reading on the ammeter.

(3)

- (ii) The variable power supply was adjusted until the reading on the ammeter became  $0 \mu\text{A}$ . The reading on the voltmeter was 3.59 V.

Calculate the work function, in joules, of the metal used in the photocell.

frequency of ultraviolet used =  $2.00 \times 10^{15} \text{ Hz}$

(4)

Work function = ..... J

(Total for Question 14 = 10 marks)