

- 7 A circuit used to investigate the photoelectric effect is shown in Fig. 7.1.

Electromagnetic radiation of wavelength 450 nm is incident on metal plate A and the stopping potential is 1.1 V.

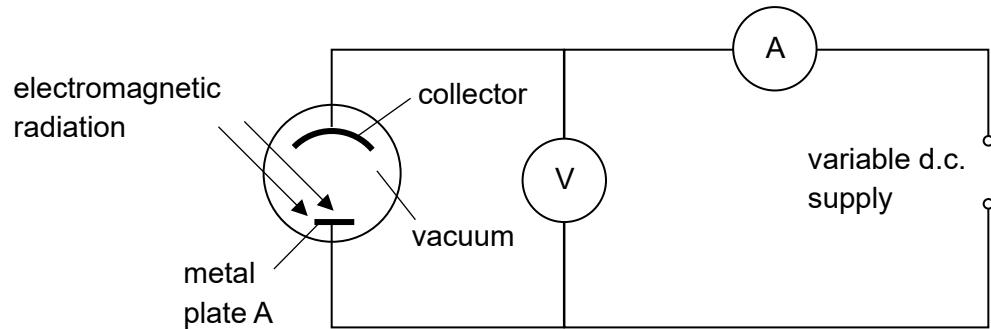


Fig. 7.1

- (a) Calculate the maximum kinetic energy of the photoelectrons emitted from metal plate A.

$$\text{maximum kinetic energy} = \dots \text{J} \quad [2]$$

- (b) Determine the threshold frequency of metal plate A.

$$\text{threshold frequency} = \dots \text{Hz} \quad [3]$$

- (c) Explain whether maximum kinetic energy of the photoelectrons emitted from metal plate A is affected by the intensity of the electromagnetic radiation incident on the surface at constant frequency.
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[1]

- (d) The collector in Fig. 7.1 is replaced by metal plate B as shown in Fig. 7.2.

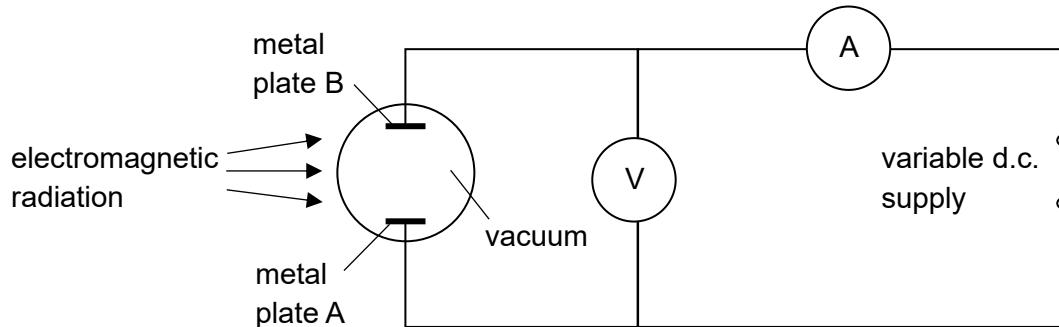


Fig. 7.2

Metal plate B has a higher threshold frequency than metal plate A.

The current-voltage ( $I - V$ ) characteristic is obtained when both plates are illuminated with monochromatic electromagnetic radiation of frequency higher than the threshold frequencies of both plates.

On Fig. 7.3, sketch the  $I - V$  characteristic.

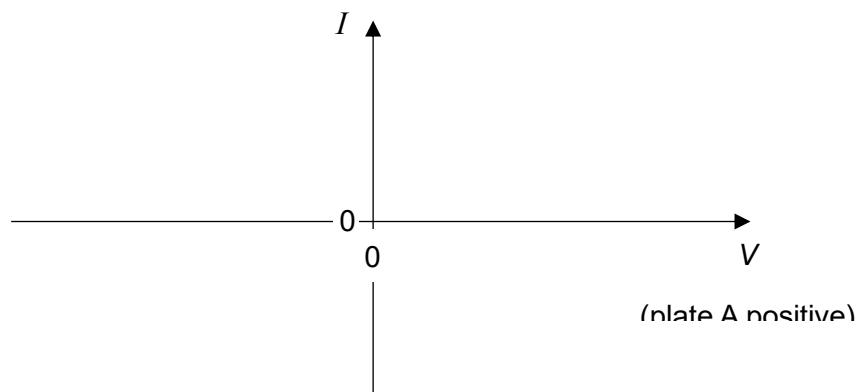


Fig. 7.3

[2]

## **Section B**

Answer **one** question from this Section in the spaces provided.