5

(a) With reference to the photoelectric effect, state what is meant by the *threshold frequency*.

……

…….. [1]

(b) Electromagnetic radiation of wavelength λ is incident on a metal surface. Electrons of maximum kinetic energy E_{MAX} are emitted.

(i) On Fig. 5.1 sketch the variation with $1/\lambda$ of E_{MAX}. [2]

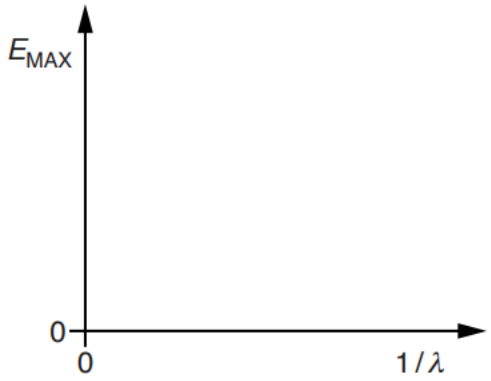

Fig. 5.1

(ii) State an equation relating the gradient of the graph on Fig. 5.1 to the physical constants used. Identify these constants.

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…….. …..

…….[2]

(iii) Explain why, for any particular wavelength of electromagnetic radiation, most of the electrons are emitted with kinetic energies less than the maximum value E_{MAX}.

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…….. [2]

(iv) Light of a particular wavelength is incident on a metal surface and gives rise to a photoelectric current. The wavelength is reduced while the intensity of the light is kept constant. State and explain the effect, if any, on the photoelectric current.

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…….[3]

[Total: 10]