

A level Physics B

H557/01 Fundamentals of physics

Question Set 20

1

This question is about a model of an atom with one electron.

The electron is trapped in a box as shown in **Fig. 1**.

Possible electron kinetic energy levels are plotted as shown.

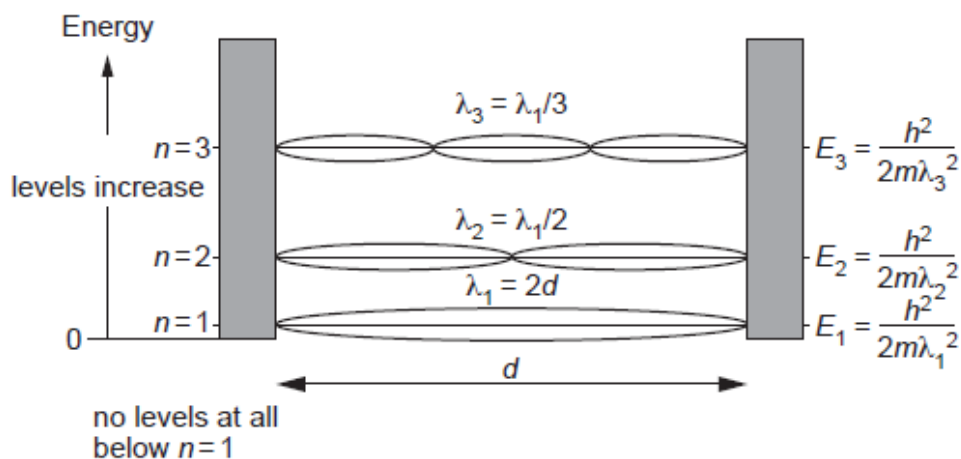


Fig.1

(a) Explain how this model gives rise to discrete quantised energy levels for the atom. [2]

(b) How many different frequencies of photon can be emitted from an atom with 3 energy levels?

(c) The distance d between the walls of the box is about atomic size ≈ 0.10 nm. [1]

Calculate the frequency of the most energetic photon that this model atom could emit.

frequency =Hz [3]

Total Marks for Question Set: 6

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