

GREENHILL ACADEMY- SECONDARY
S.6 HOLIDAY WORK
PHYSICS Paper 1

Attempt all questions

Research about Bohr's model and energy levels and answer the following questions;

1. The energy levels of the hydrogen atom are given by the expression

$$E_n = \frac{-13.6}{n^2} eV, \text{ where } n \text{ is an integer.}$$

- i) What is the ionization energy of the atom in joules?
 ii) What is the wavelength of the line which arises from transition between $n = 3$ and $n = 2$? State the region where it lies

2. The energy levels of an atom have values;

$$E_1 = -21.4 eV,$$

$$E_2 = -4.87 eV,$$

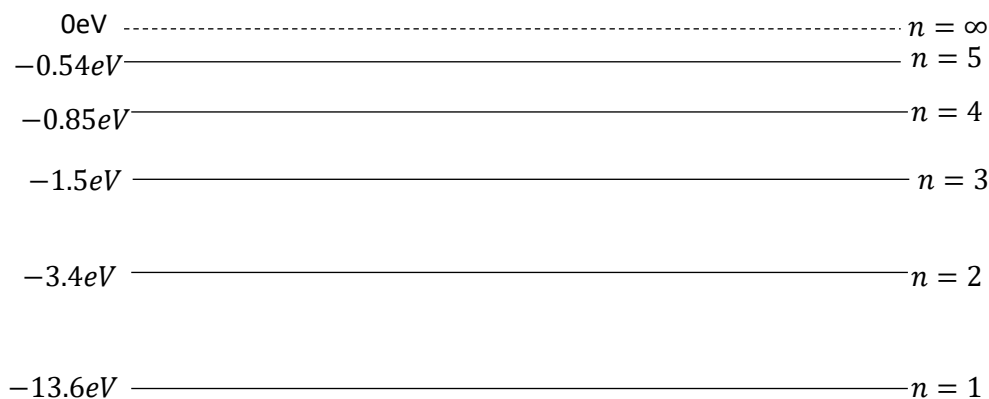
$$E_3 = -2.77 eV,$$

$$E_4 = -0.81 eV,$$

$$E_\infty = 0.00 eV$$

- i) Calculate the wavelength of radiation emitted when an electron makes a transition from E_3 to E_2
 ii) State the region of the electromagnetic spectrum where the radiation lies

3.



The diagram shows some of the energy levels of the hydrogen atom.

- i) Calculate the wave length of the radiations emitted when the electron initially in the $n = 2$ makes a transition to the ground level.
 ii) If the atom in its ground state absorbs $1.936 \times 10^{-18} J$ of energy, to what level does the electron make a transition?

References:

- a) Advanced level physics by Nelkon and Parker fifth edition pages 1081-1089(find text book on Whatsapp platform for physics class)
 b) https://youtu.be/XVSyOHIWFc4?si=WjOEC_9vZpDQZZN-
 c) <https://youtu.be/mXxsT1ut35Q?si=m82m6tH6cDBSGXKD>