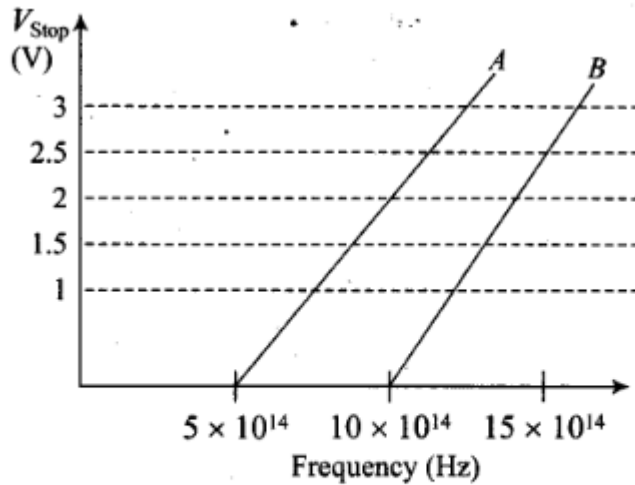


Question 4 : A student performs an experiment on photoelectric effect, using two materials A and B. A plot of V_{stop} versus ν is given in figure.



- (i) Which material *A* or *B* has a higher work function?
 (ii) Given the electric charge of an electron = 1.6×10^{-19} C, find the value of h obtained from the experiment for both *A* and *B*.
 Comment on whether it is consistent with Einstein's theory.

- (i) As for metal B electron with minimum energy is emitted at higher frequency therefore metal B has higher work function than A.
 (ii) For V vs frequency graphs,
 Slope is given by h/e .
 Slope = h/e

For metal A, slope = $\frac{h}{e} = \frac{2}{(10-5) \times 10^{14}}$

$$h = \frac{2e}{5 \times 10^{14}}$$

$$h = 6.4 \times 10^{-34} \text{ J}\cdot\text{s}$$

Similarly can be done for metal B also.

Yes it agrees with Einstein's theory.