CL17_Q1. Discuss quantum mechanical tunnel effect to explain the emission of alpha particles from a radioactive nucleus.

CL17_Q2. Why is alpha decay a classically forbidden phenomenon and how the phenomenon is well explained using the laws of quantum mechanics.

CL17_Q3. A proton and an alpha particle with the same energy $\boldsymbol{E}$ approach a potential barrier whose height is $\boldsymbol{V_o} > E$. Do they have the same probabilities of getting through? If not which has greater probability and why?

CL17_Q4. The quantum mechanical transmission coefficient of an alpha particle through a nuclear potential barrier is 2.54×10^{-24}. Taking the velocity of the alpha particle and the nuclear radius as 1.7×10^{7} m/s and 10^{-14} m, respectivetly, calculate the mean lifetime of alpha decay.

CL17_Q5. How to find the lifetime of the nucleus by using barrier tunneling?