

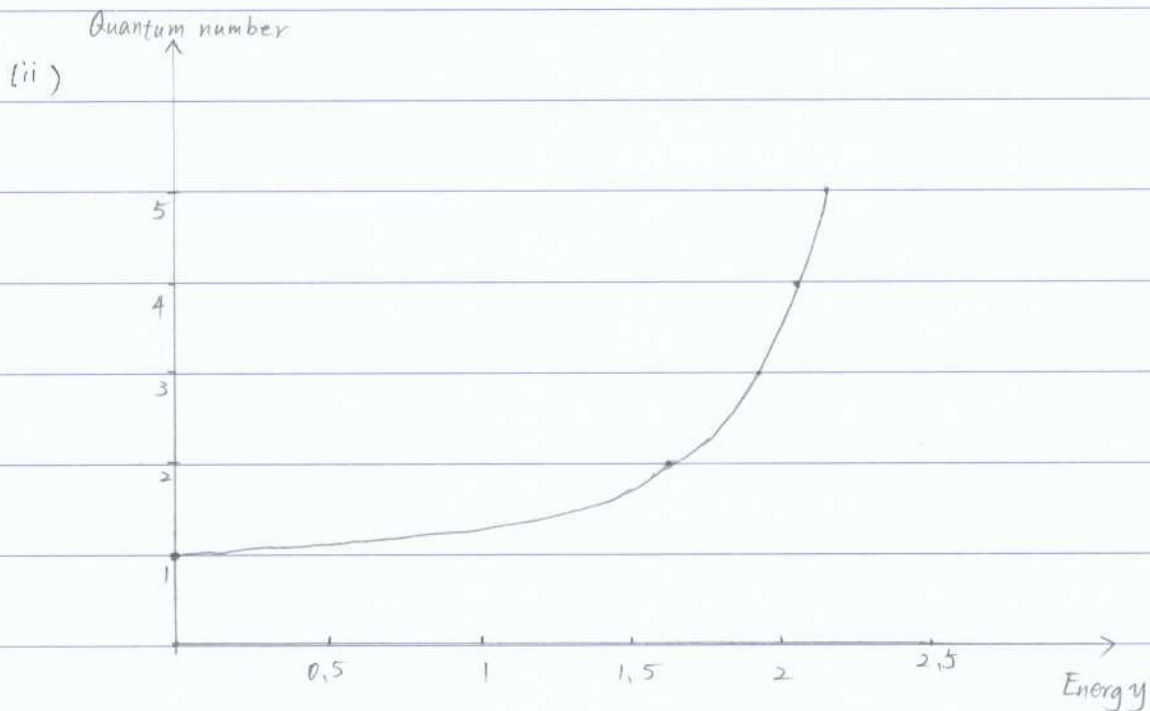
(a) (i) nucleon : transform from nuclear and photon , it's an energy.

(ii) One property of nucleons could be nuclear fission.

(b) (i) $n_1 = 3, E_1 = 1.94 \times 10^{-18} \text{ J}$

$n_2 = 4, E_2 = 2.04 \times 10^{-18} \text{ J}$

$E = E_2 - E_1 = 2.04 \times 10^{-18} - 1.94 \times 10^{-18} = 0.1 \times 10^{-18} \text{ J}.$



(c) The penetrating power of alpha, beta and gamma radiation on a range of materials is $\alpha < \beta < \gamma$. Because ~~the~~^{if} Quantum number increasing, the energy increasing. Alpha, beta and gamma ~~are~~ radiation has the same situation with that. so when they ~~are~~^{are} on a range of materials, it shows gamma greater than beta and alpha.

(d) The Manhattan Project is the codename given to the development of atomic (nuclear fission) bombs during World War II.

The significance of this project for our society is that it useful but don't make effect on our human's war.

The atomic bombs are advantage ~~ten~~ technoledges in science. The energy is very strong and dangeous, the nuclear fission cause again and ~~again~~ again. And after that, it will make the area ~~have~~ people ~~to~~ to get cancer. So in human's war, the effect is so terriable. Therefore, most of countrij's reader sign the agreement of never use atomic bombs in the future.



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(e) Chadwick's & Fermi's work resulted in a greater understanding of the atom. They explained that atom can use in many area, include atomic bombs, and a lot of experiences about technology development. They ~~At~~ outline the ^{power} ~~energy~~ between alpha, beta and gamma.