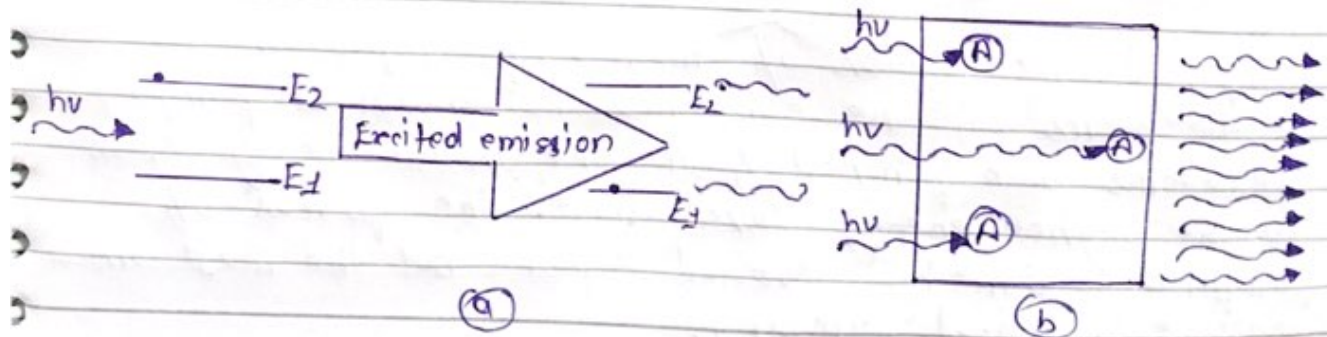
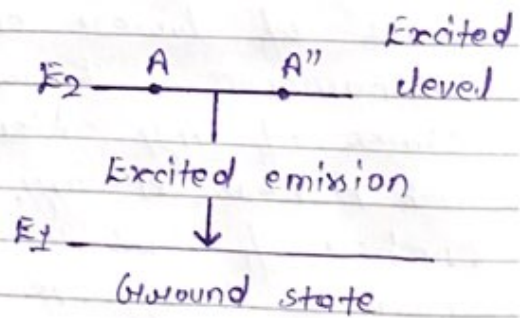
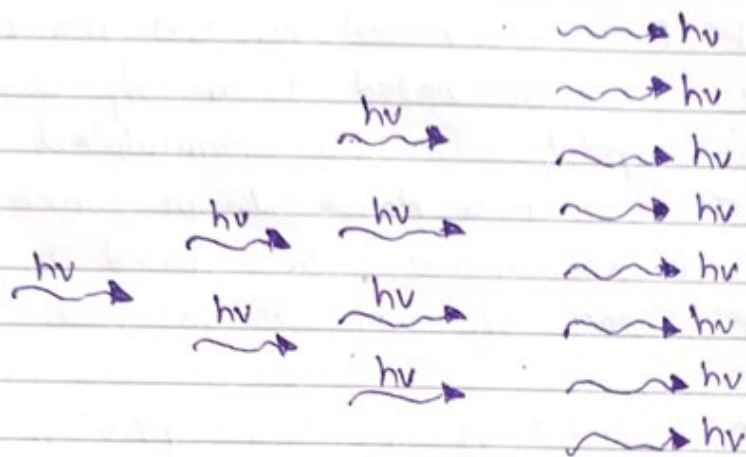


Ans 1. LASER:- The LASER was invented by T.H Maiman in 1960. Laser is an abbreviated form of English sentence. 'Light Amplification by Stimulated Emission of Radiation'. It is such a device from which a highly intense, monochromatic, collimated and highly coherent beam of light is obtained.

① STIMULATED EMISSION :- If the light photon of the same frequency collides with any atom when it is in the excited state E_2 that is about to be emitted from that atom, then that atom immediately shifts to lowest energy state E_1 and stimulates the light falling upon it emitting the light photon of the exactly same frequency. This phenomenon is shown in diagram 77 (a). This type of emission is known as stimulated emission. It happens before spontaneous emission (i.e., before 10^{-8} seconds).





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② Population Inversion! Normally in any substance, the population of atoms with higher energy (N_2) is lesser than the population of the atoms with lower energy (N_1) i.e., generally $N_2 < N_1$. If N_2 is made $N_2 > N_1$ with the help of pumping process that is to say if the number of atoms of high energy levels is made greater than the number of atoms of lower energy levels; then this phenomenon is known as "Population Inversion". Those states of any system in which the number of atoms with higher energy levels is greater than the number of atoms with lower energy levels, are also known as "Negative Temperature state".

③ Pumping! The process of maintaining population inversion in the atoms of the substances is known as pumping. The atoms are pumped from the lower energy levels to the higher energy levels in it. The process of pumping is done by several types, but the most common method is optical pumping.