

Ques 1:- A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. The term laser originated as an acronym for light amplification by stimulated emission of radiation. The first laser was built in 1960 by Theodore H Maiman. Laser is used in optical disk drives, laser printers, barcode etc.

(a) Stimulated emission is the process by which an incoming photon of a specific frequency can interact with an excited atomic electron (or other excited molecular state), causing it to drop to a lower energy level.

(b) Population inversion occurs when more electrons in a particular situation, are in a higher energy state than in a lower energy state. Population inversion can be thought of as an inversion from the standard, since electrons are typically located in lower energy states.

(c) The process by which atoms are raised from a lower to a higher energy state is called "pumping" of atoms.

- (i) excitation by a strong source of light
- (ii) excitation by electron impact
- (iii) excitation by chemical reaction.
- (iv) excitation by supersonic gas expansion.