Shri Shivaji Shikshan Perasarak Mandal Barshi's

Karmaveer Mamasaheb Jagdale Mahavidyalaya, Washi

List of PPT's of ICT Using Teachers

Sr. No.	Teachers Name	Department	PPT Topic
1	Dr. Devkate Balaji Narayan	Commerce	Management Accounting
2	Dr. Katte Anil Yallappa	English	Sentences, Clauses and Phrases
3	Prof. Gund Kundalik Dnyandeo	English	Syllabels
4	Prof. Chandanshive Mahendra Ankush	Marathi	दूरचित्रवाणीसाठी लेखन
5	Dr. Karade Anandkumar Subhash	Political Science	Inportanat features of Indian Constitution
6	Dr. Karade Anandkumar Subhash	Political Science	President of India
7	Dr. Bhanje Vijaykumar Prlhad	History	महाराष्ट्रातील ब्रिटीश सत्तेचे प्रारंभीचे स्वरूप
8	Dr. Bhanje Vijaykumar Prlhad	History	मुद्रण व वृत्तपत्रे
9	Prof. Jadhav Rambhau Raosaheb	Chemistry	Bohrs Atomic Model
10	Prof. Jadhav Rambhau Raosaheb	Chemistry	Elementry Quantum Mechanics
11	Prof. Chaudhary Vishwas Ganpat	Chemistry	Bio-Inorganic Chemistry
12	Prof. Chaudhary Vishwas Ganpat	Chemistry	Ligand Bonding In Transition Metal Complexes
13	Dr. Kathare Ravindra Vyankatrao	Physics	Thirmodynamics
14	Dr. Garad Vilas Kisanrao	Zoology	Cell Biology & Moliculer Biology
15	Prof. Doke Shamsunder Sarjerao	Botany	Cell

Principal

I/C Principal
Karmaveer Mamasaheb Jagdale
Mahavidyalaya, Washi.

LASER

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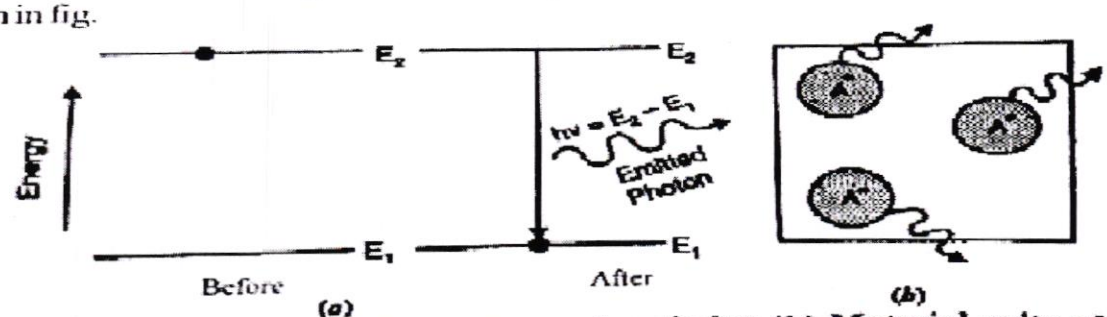
Light Amplification by Stimulated Emission of Radiation

Induced Absorption / Stimulated Absorption / Absorption

Spontaneous emission :

This process in which an excited atom emits a photon all by itself and without any externa impetus is known as **spontaneous emission**.

An excited atom can stay at the excited level for an average lifetime τ_{sp}. If it is not stimulated by any other agent during its short lifetime, the excited atom undergoes a transition to the lowe energy state on its own. During the transition it gives up the excess energy in the form of a photon, as shown in fig.



[Fig : Spontaneous emission process a) emission (b) Material exits photons]

Where A denotes an atom in the lower state & 'A*' an excited atom. The number of atoms per unit volume makes the upward transitions from lower level to upper level per second is called the **rate of absorption transition**. i.e.

$$R_{abs} = -\frac{dN_1}{dt} \qquad \text{---- (2)}$$

where - dN_1/dt is rate of decrease of population at the rate of lower level E_1.

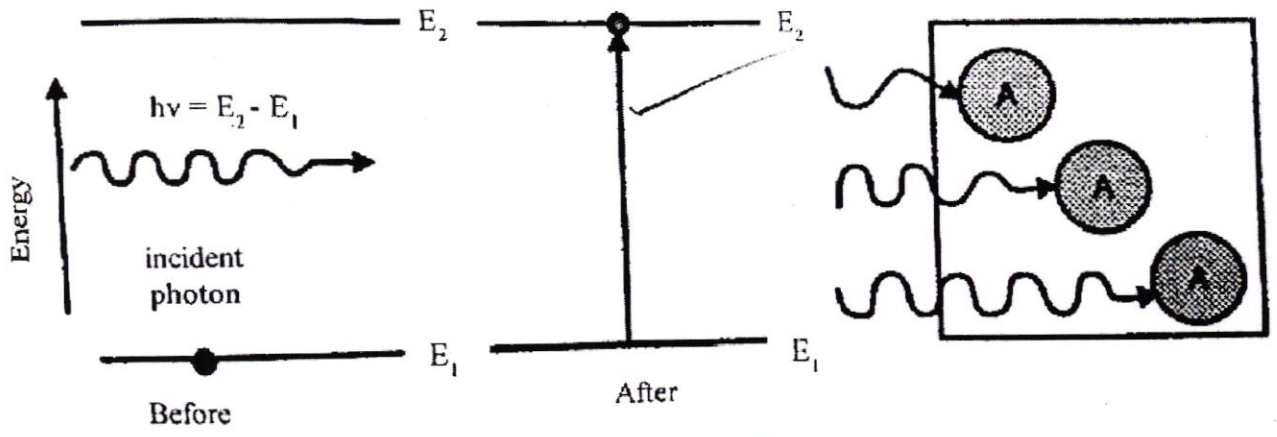
Also the rate of absorption transition can also be represented by the rate of the increase of population at the upper level. E_2 is as,

$$R_{abs} = \frac{dN_2}{dt} \qquad \text{----- (3)}$$

comp (2) & (3) we have,

Spontaneous Absorption

Induced Absorption : An atom residing in the lower energy level E_1 may absorb the incident photon and jump to excited state E_2 as depicted in Fig. This transition is known as **induced** or **stimulated absorption** or simply absorption.



[Fig. a) Induced absorption (b) Material absorbs photons]

Stimulated Emission

Stimulated Emission :

The Process of emission of photon by an excited atom through a forced transition occurin under the influence of an external agent is called **induced or stimulated emission.**

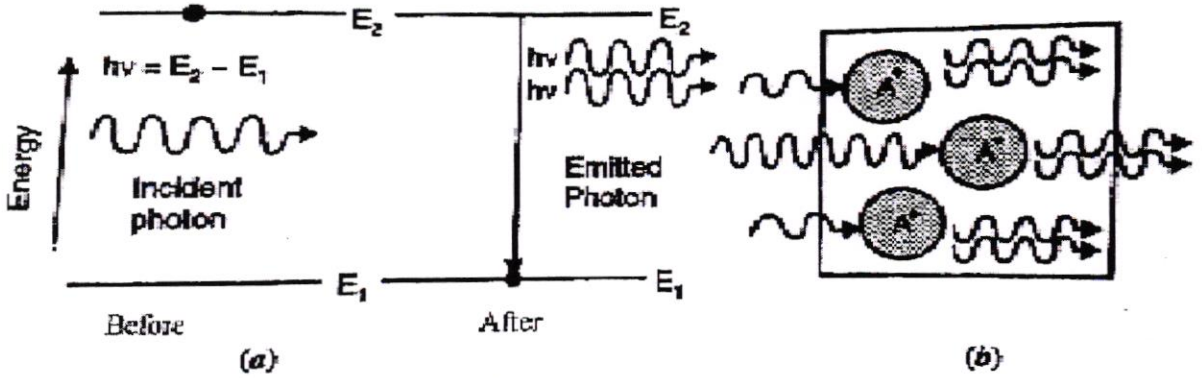


Fig. Stimulated emission (a) emission (b) material emits photons in coordinated manne

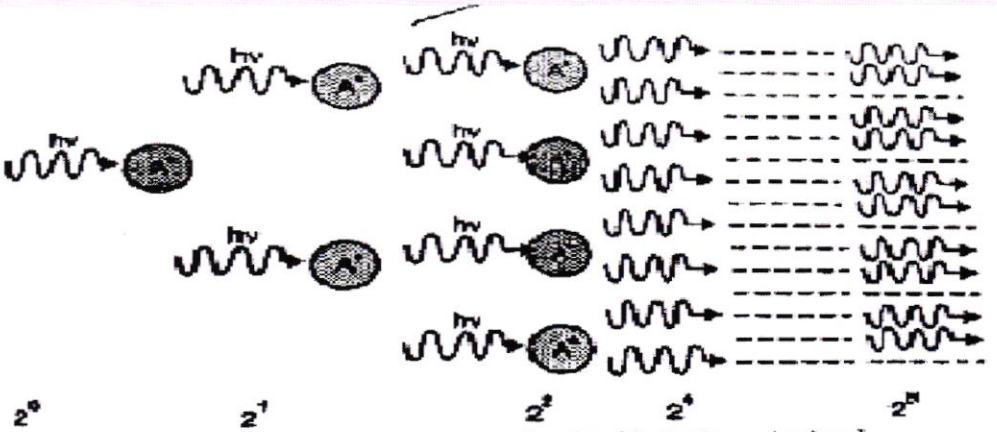
$$A^* + h\nu \rightarrow A + 2h\nu \qquad \text{--- (1)}$$

The rate of stimulated emission of photons is given by,

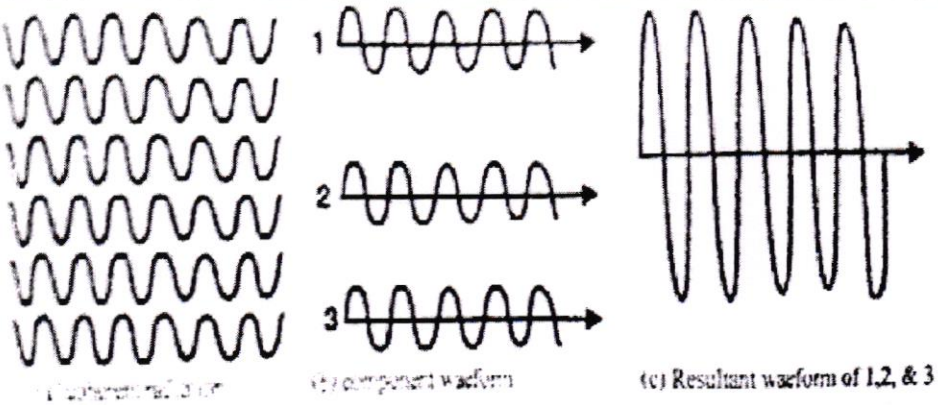
$$R_{st} = B_{21}\,\rho(\nu)\,N_2 \qquad \text{---- (2)}$$

where, B_{21} is Einstein coefficient for stimulated emission.

Light Amplification and Coherence

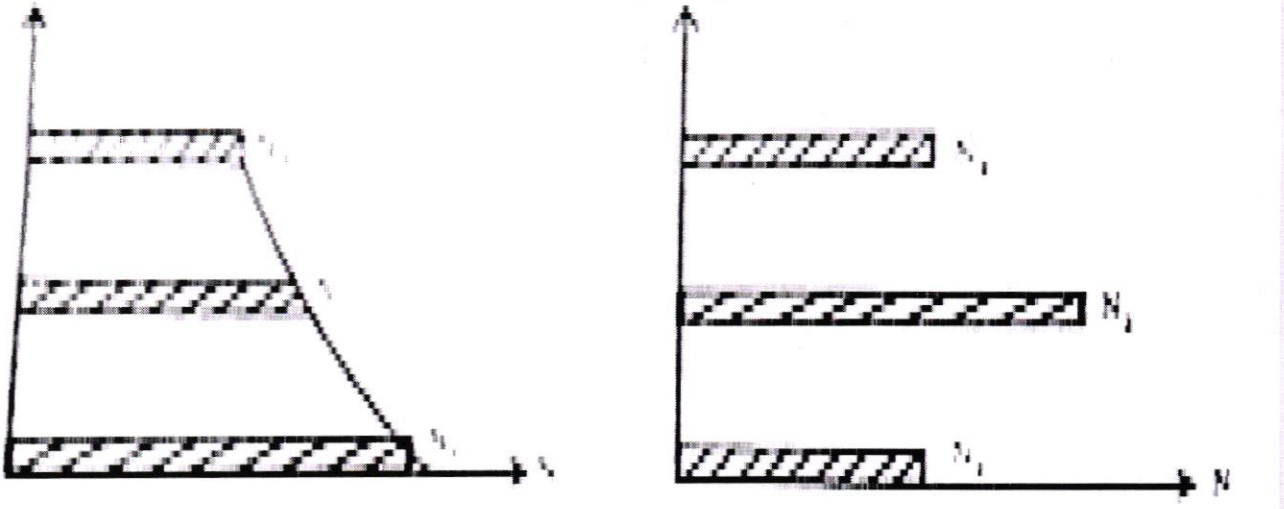


[Fig. Multiplication of stimulated emission]



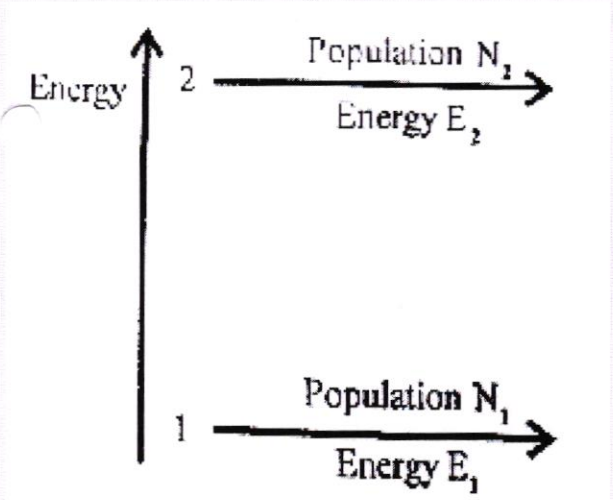
[Fig : Coherent Radiation]

Population Inversion

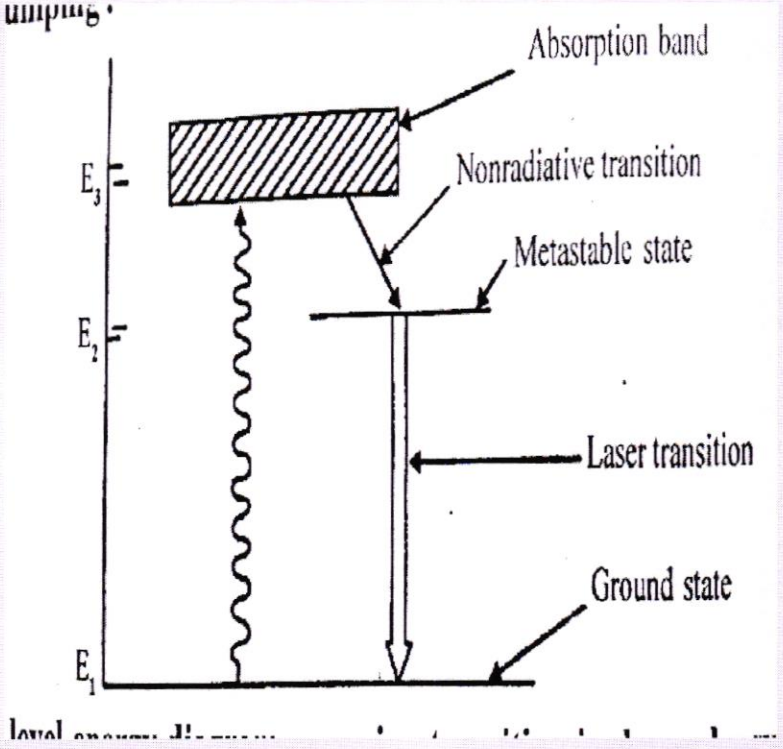


(Fig. Three level system)

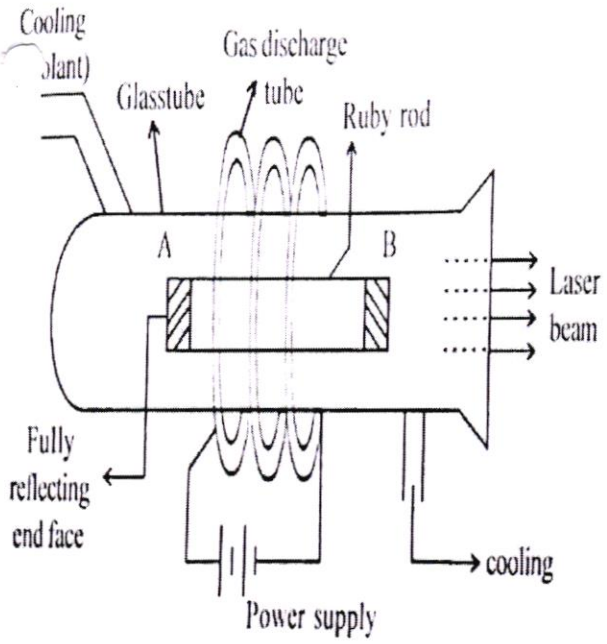
Laser Pumping



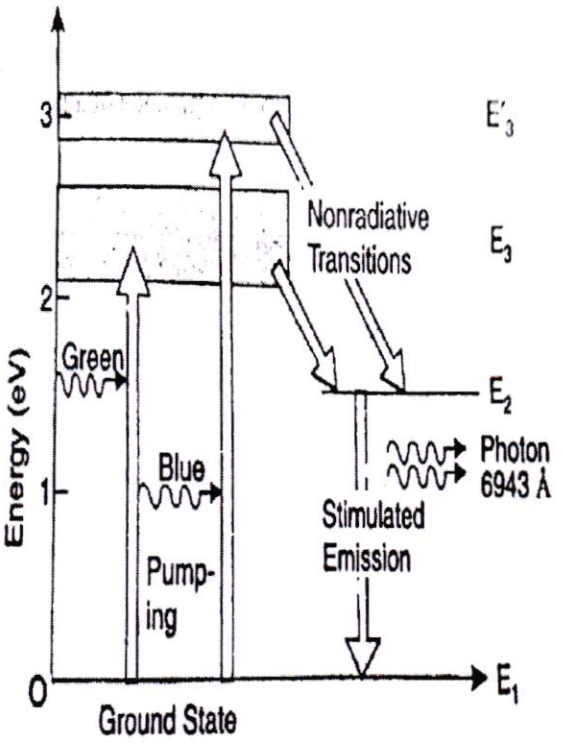
[Fig. Two level energy system]



Ruby Laser

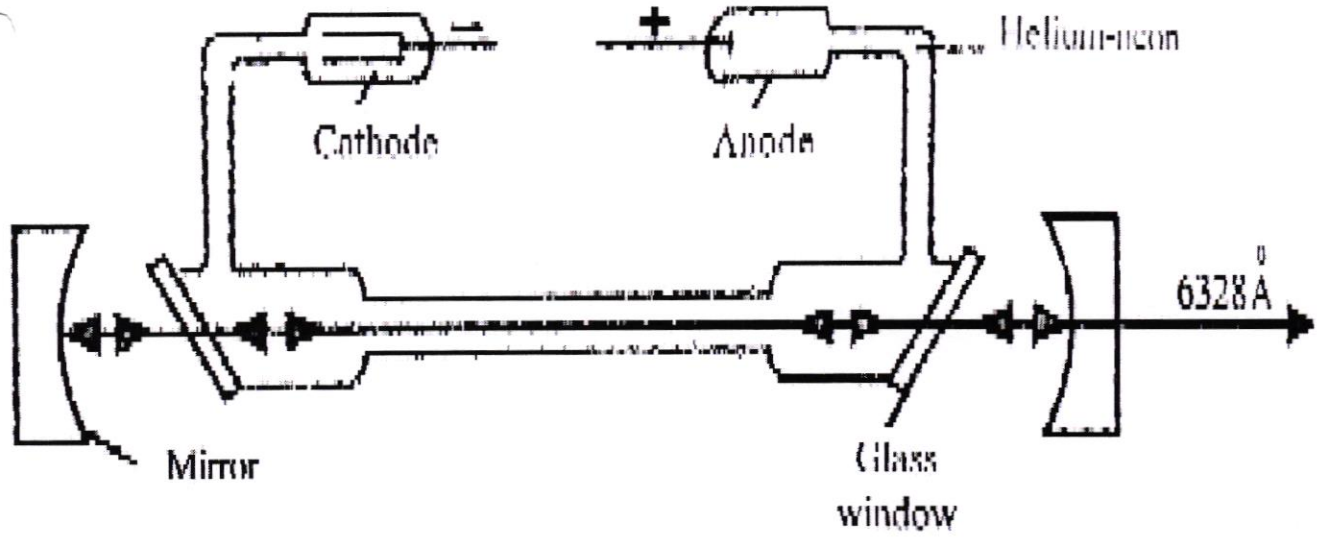


[Fig. a : Schematic representation of Ruby laser]



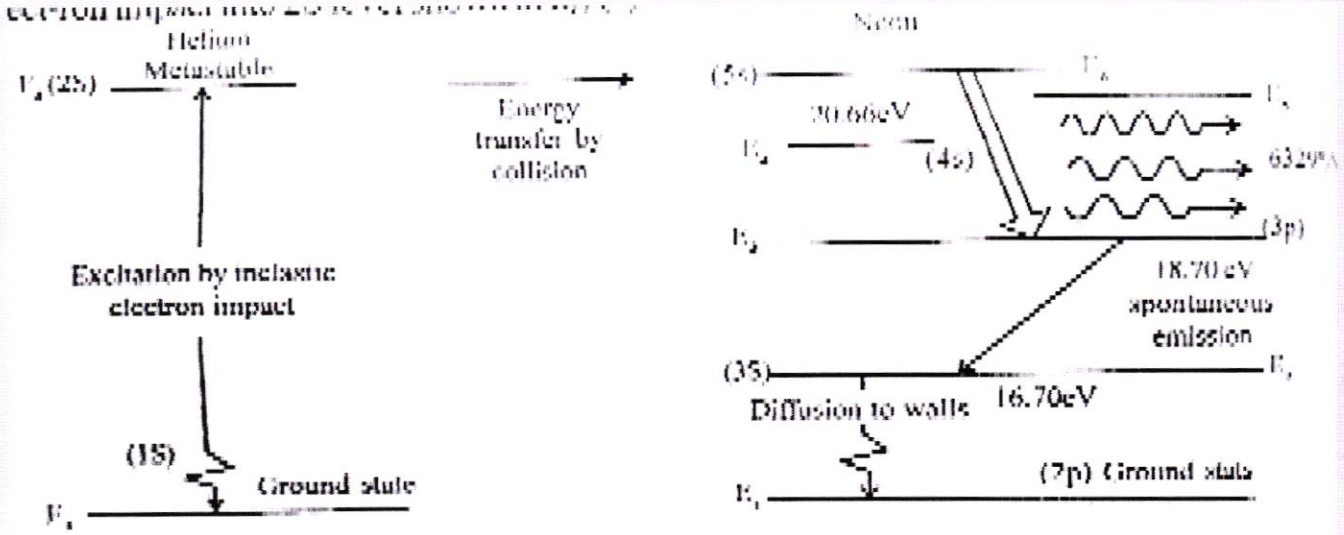
[Fig. b : Energy levels of chromium ruby laser]

He – Ne Laser



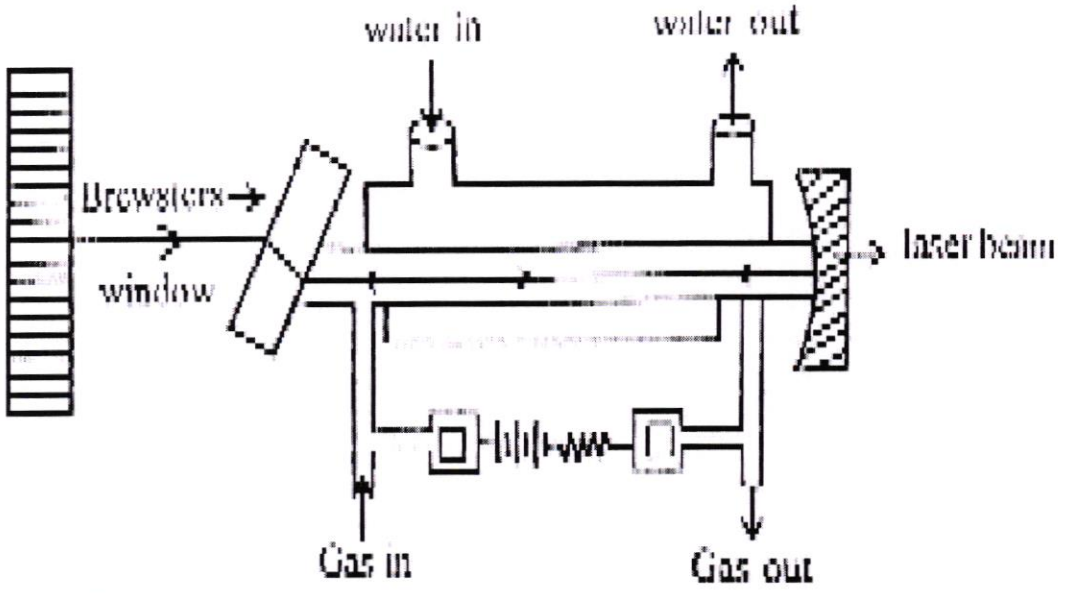
[Fig. a : Schematic representation of He - Ne laser]

He – Ne Laser Energy Level Diagram



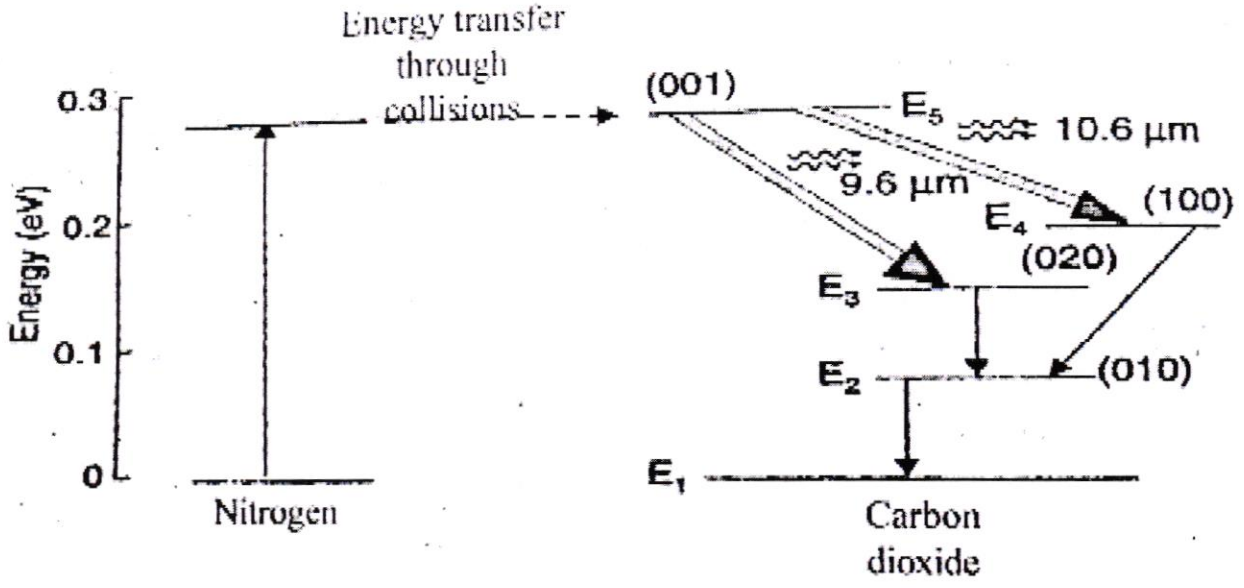
[Fig. 5 : Energy level diagram of He-Ne laser]

CO_2 Laser



[Fig.(b): Schematic representation of a carbon dioxide laser]

CO_2 Laser Energy Level Diagram



[Fig. C : Energy level diagram of CO_2 laser]

Applications

1. Biological
2. Medical
3. Industry

Good Luck

for

your
Examination