SEMESTER III

Lasers

Course No:	**PHY17-310OE**	Max. Marks:	50
		External Examination:	40
No. of credits: **02**		Internal Assessment:	10

UNIT – I

Absorption, spontaneous and stimulated emission. Einstein coefficients, Trasition propability and lifetime of an atom in an excited state. Population inversion. Laser rate equations: The three level and four levelsystems. Line broadening mechanism. Shape and width of spectral lines. Optical resonators: Qualityfactor. Losses inside the cavity. Threshold conditions. Schawlow-Townes condition. Transverse and longitudinal mode selection.

UNIT – II

Laser Systems He-Ne laser. CO_2 laser. Four level solid state lasers. Dye lasers. Ar+ laser. Excimer lasers. Properties of laser beam: directionality, mono chromacity, intensity, coherence (temporal and Spatial). Applications oflasers: Laser induced fusion. Isotope separation.

Textbooks:

1) Thyagarayan, K. and Ghatak, A.K.: LASERS: Theory & Application
2) Laud, B.B.: Laser and Non-linear Optics (Wetey-Eastern)