Laser Design

1. Theory :-

   A: Two ,three and four level laser system.

   B: Laser

   Oscillation :amplification ,gain ,threshold ,gain saturation ,rate equation for three and four-level laser schemes ,special hole burning.

   C: Laser Oscillation :out put intensity, in homogeneously broadened laser media ,laser bandwidth ,single mode oscillation.

   D: Multimode and transient oscillation Q-switching ,multimode laser oscillation, mode locking ,ultra-short pulses.

   E: laser pumping mechanisms.

2. Optical:-Fabry –perot resonator , stability condition ,mirrors , grating ,etalons , prisms , lenses , non-linear optical materils.
3. Electrical:- power supplies ,spark gaps , laser electrodes , cooling system , marks bank ,voltage doublers ,flash lamps , thyratrons .
4. Mechanical:- laser housing.
5. Laser systems:- co_2 laser: TEA,TE ,CW,TE-CW , Excimer laser , chemical laser He-Ne laser , Cu-vapor laser , Nd-Yag laser ,FEL,X-ray laser.