**Numerical Problems on LASER**

Q.1. Find the ratio of the population of the two energy states of the active medium producing laser transition between, which has wavelength 694.3nm at room temperature (27 °C). Comment on the result.

Q.2. The wavelength of emission is 6000 Å and the coefficient of spontaneous emission is 106 /s. Determine the coefficient for the stimulated emission.

Q.3. At what temperature are the rates of spontaneous and stimulated emission equal? Assume λ=5000 Å.

Q.4. The length of a laser tube is 150 mm and the gain factor of the laser material is 0.0005/cm. If one of the cavity mirrors reflects 100% light that is incident on it, what is the required reflectance of the other cavity mirror?

Q.5. A LASER source is emitting a laser beam with an average power of 4.5 mW. Find the number of photons emitted per sec by the laser .The wavelength emitted is 6328 Å .

Q.6. A pulsed LASER emit photons of wavelength 780 nm with 20 mW average power/pulse. Calculate the number of photons contained in each pulse if pulse duration is 10 ns.