CL35_Q1. Starting from the rate equations for the absorption and emission processes in a two level system show that the coefficients of stimulated emission and the coefficient of induced absorption are equal.

CL35_Q2. Obtain the expression for energy density of radiation under equilibrium condition in terms of Einstein's coefficients.

CL35_Q3. If R_1 is the rate of stimulated emission and R_2 is the rate of spontaneous emission between two energy levels, show that $\lambda = \frac{hc}{[kT\ ln\{(R_2/R_1)+1\}]}$.

CL35_Q4. A source emits a radiation of wavelength of 400 nm, at what temperature the rates of spontaneous and stimulated emission will be equal.

CL35_Q5. If B_{10} = 2.7 x 10^{19} m^3/W-s^3 for a particular atom, find the life time of the 1 to 0 transition at 550nm.