CL40_Q1. Discuss round trip gain in a laser medium and hence obtain the expression for threshold gain.

CL40_Q2. Explain the necessary conditions for designing a laser cavity.

CL40_Q3. Find the number of modes of the standing waves and their frequency separation in the resonant cavity of length 1m of He-Ne laser operating at wavelength of 632.8 nm.

CL40_Q4. Calculate the threshold gain factor of a helium–neon laser, which has a loss factor of 0.05 $m^{-1}$. If the configuration of the system is as follows: (a) A 50-cm tube with one mirror 99% reflecting and the output coupler 90% reflecting and (b) A 20-cm tube with one mirror 99% reflecting and the output coupler 97% reflecting. Comment on the results obtained.