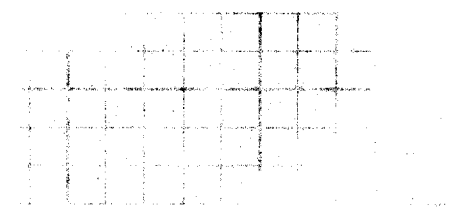


# Quiz

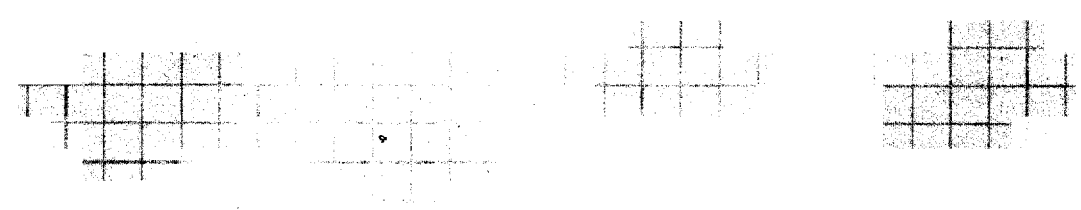
- ① Draw a picture of a narrowband laser. Label all the components.



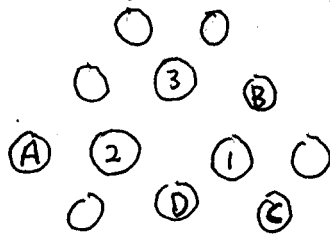
- ② Show how population inversion can be achieved using a 4 level system model



- ③ Why don't we see second harmonic generation in regular liquids?



- ④ Let Beam 1 be  $\vec{k}_1, \omega_1$ , Beam 2 be  $\vec{k}_2, \omega_2$  and Beam 3 be  $\vec{k}_3, \omega_3$  give the phase-matching condition for signals A, B, C, and D also give the frequency of the signals.



$k_A =$   $\omega_A =$

$k_B =$   $\omega_B =$

$k_C =$   $\omega_C =$

$k_D =$   $\omega_D =$