

More than one answer may be correct -- circle all correct answers

1. In a four-level laser above threshold, as the pump power increases
  - a) the population inversion increases
  - b) the slope efficiency increases
  - c) the heating of the gain medium increases
  - d) the cavity lifetime increases
  - e) none of the above
  
2. An etalon in a laser cavity
  - a) increases the output power
  - b) decreases the spectral width of the output
  - c) can be used to create a short pulse
  - d) lowers the lasing threshold
  - e) none of the above
  
3. For an inhomogeneously broadened gain transition above threshold, the number of lasing modes
  - a) increases with increasing pump power
  - b) decreases with increasing pump power
  - c) is independent of pump power
  - d) can either increase or decrease with increasing pump power
  - e) none of the above
  
4. The acousto-optic modulator
  - a) deflects the entire beam
  - b) decreases the spectral width of the output
  - c) can be used to create a short pulse
  - d) increases the average output power
  - e) none of the above
  
5. Vibrational states are involved in a
  - a) He-Ne laser
  - b) CO<sub>2</sub> laser
  - c) Nd:YAG laser
  - d) Ti:sapphire laser
  - e) none of the above