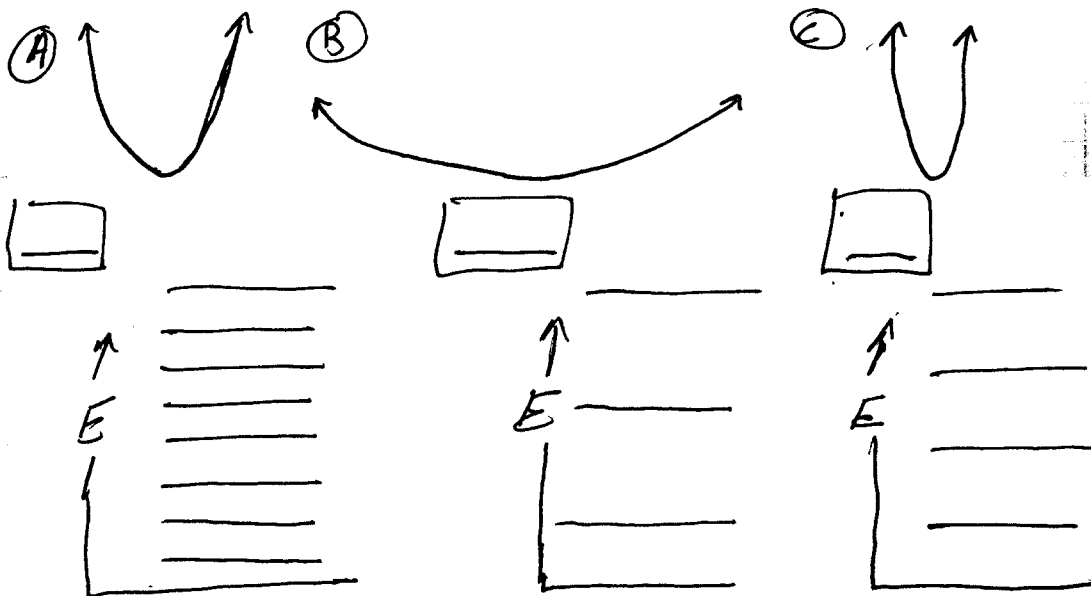
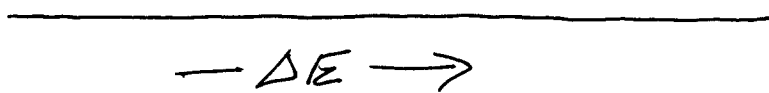


① Match the Harmonic oscillator potential with the energy level diagram. Also indicate which has the largest force constant. (Assume the same mass for all).



② Qualitatively sketch the vibrational spectrum for a mixture of regular hydrogen and its isotope Deuterium.

The mixture: 50% H_2 25% HD 25% D_2



③ The spectrum below is for a mixture of diatomic gases.



- a) Which diatomic requires the most energy to ~~pull~~ move the atoms?
- b) Which diatomic has the lowest vibrational constant?
- c) Which diatomic has the most zero point energy?