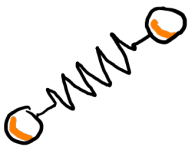
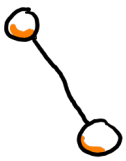
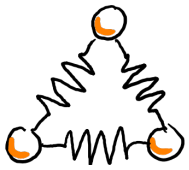
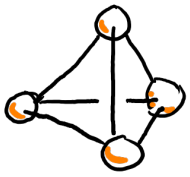
If the microscopic world was classical, predict $U_{\text{classical}}(T)$ for the following "toy molecules" in the gas phase.

(a)  (b)  (c)  (d) 

- Each ball is a point mass m with no moment of inertia.
- The zig-zag lines are springs which are freely jointed at the balls.
- Vibrational motion of the springs is very small ($\ll$ the length of the spring).
- The springs can extend and compress, but cannot twist or flex.
- The straight lines are rigid rods.