The canonical ensemble

- Explain why function can be used to calculate the energy, number of atoms and volume of a microstate. What are the arguments of these functions?

- What is the name of the function that is used to calculate the energy of a microstate.

- Which extensive thermodynamic variables are constrained to have a particular value in the canonical ensemble.

- Give an expression for the probability of being in a microstate in the canonical ensemble

The canonical ensemble

- Give an expression for the canonical partition function

- Give an expression for $\frac{\mathrm{d}S}{k_B}$ for the canonical ensemble that can be obtained using arguments based on statistical mechanics.

- Explain why in the previous expression we can write terms such as $\left\langle \frac{\partial H}{\partial N} \right\rangle$ and $\left\langle \frac{\partial H}{\partial V} \right\rangle$

- Give an expression for β and explain how this result is derived.