Quiz 2 Instructor: Ralf W. Gothe **2/27/25**

2.1) Give values and units for α, $\hbar c$, and kT.

2.2) **Formulate** the five terms contributing to the binding energy in the Weizäcker (or liquid drop) model.

2.3) Formulate the binomial distribution and explain the variables.

2.4) Formulate the Poisson distribution and explain the variables.

2.5) Define the number of possible final states in the final momentum interval $p' + dp'$.

2.6) State Fermi's Golden Rule for radioactive decays.

2.7) How is the lifetime τ related to the decay constant, half-life time, and average lifetime?

2.8) What causes long lifetimes in α-decays?

2.9) Write down the electron-neutrino capture reaction!

2.10) What is the name, parity, and angular momentum of an $C2$ photon?