Name: **Gruppe:**

Problem sheet 13 – Physics V – WS 2006/2007

Due: February 01/02, 2007 (in your group)

13.1 Nuclear fission and Bethe-Weizsäcker formula   (40 Points)

When a $^{235}_{92}$U nucleus captures a thermal neutron it breaks into two pieces.

a) Assume that no extra particles are emitted during the fission, the fission is symmetric and the fission products have no internal excitation. Check with the Bethe-Weizsäcker formula whether the Uranium fragments are stable against neutron decay.

b) It is known that a $^{235}_{92}$U fission process releases approximately two neutrons and the masses of the nuclear fragments are different. The total energy of the decay products depends only weakly on the mass difference of the fragments.

Compute with the Bethe-Weizsäcker formula the total kinetic energy, which is carried by two equal fission products, two neutrons and additional photons.