Exercises on elementary particles

date: .... , class: .... , student: ....

- **Exercise 1:** Calculate the frequency of the γ generated by the reaction

$$\mu^+ + \mu^- \longrightarrow 2\gamma.$$

  The mass of the muon is 105.658MeV/c^2.

- **Exercise 2:** Determine the baryon number of the following combination of quarks and antiquarks:

Quark composition	Baryon number
uud	1
$\bar{u}\bar{d}\bar{d}$	
$b\bar{b}$	
$cs\bar{d}\bar{u}$	
$t\bar{b}sd\bar{t}$	
$\bar{u}scb$	

- **Exercise 3:** Determine whether the following combinations of quarks and antiquarks could form hadrons. Motivate your answers.

Quark composition	Hadron?	Type
uud	☑	baryon
tbb	☐	
$t\bar{b}$	☐	
$c\bar{d}$	☐	
tsd	☐	
ssc	☐	