1. Consider the particles that you have considered in your first homework, where you had found the lifetimes of several unstable particles. Find their most probably decay channels and draw the Feynman diagrams corresponding to their decays. In case you do not remember which particles you studied in the first homework, do the same for $\pi^{\pm}$, $K^{\pm}$, Λ, $\Sigma^{\pm}$, Σ^{0}, $\Sigma^{*\pm}$, and Ω.

2. What is the minimum proton energy required for the reaction $p + \gamma \rightarrow p + \pi^{0}$ if the photon has energy $2.3 \times 10^{-4}\ eV$? (this photon is a typical photon in the Cosmic Microwave Background(CMB). Protons that have energy higher then the found limit rapidly lose energy through interactions with the photons of the CMB.)

Questions From the Book

3. The solar constant (the rate at which energy is incident on the Earth) is about 2 $cals/cm^{-2}$ each minute. The fusion of hydrogen to helium in the Sun produces 26 MeV energy for every Helium atom formed, plus two neutrinos carrying only a small percentage of energy. Calculate the expected solar neutrino flux at the Earth.