Exercises "Particle Physics II" (2010)

Compute the decay widths of the following processes in the standard model. Copare your numerical results with the experimental data given in http://pdg.web.cern.ch/pdg/ .

42. $Z^0 \to \ell^+\ell^-$ $(\ell = e, \mu, \tau)$.
43. $Z^0 \to \nu_\ell \bar{\nu}_\ell \Rightarrow \Gamma_{\text{invisible}}$.
44. $Z^0 \to q\bar{q} \Rightarrow \Gamma(Z^0 \to \text{hadrons})$.
45. Determine the total decay width of the Z^0.
46. $W^+ \to \ell^+\nu\ell$ $(\ell = e, \mu, \tau)$.
47. $W^+ \to q_1\bar{q}_2 \Rightarrow \Gamma(W \to \text{hadrons})$.
48. Determine the total decay width of the W-boson.
49. $\mu^- \to e^-\bar{\nu}_e\nu_\mu$ (Discuss also the energy distribution of the electron in this three-body decay.)