46. (a) The products of the carbon cycle are $2e^+ + 2\nu + {}^4\text{He}$, the same as that of the proton-proton cycle (see Eq. 44-10). The difference in the number of photons is not significant.

(b) $Q_{\text{carbon}} = Q_1 + Q_2 + \cdots + Q_6 = (1.95 + 1.19 + 7.55 + 7.30 + 1.73 + 4.97)\text{MeV} = 24.7\,\text{MeV}$, which is the same as that for the proton-proton cycle (once we subtract out the electron-positron annihilations; see Fig. 44-11): $Q_{p-p} = 26.7\,\text{MeV} - 2(1.02\,\text{MeV}) = 24.7\,\text{MeV}$.