

18. (a) From Eq. 38-47,

$$\begin{aligned} Q &= -\Delta m c^2 = (m_{\Sigma^+} + m_{K^+} - m_{\pi^+} - m_p)c^2 \\ &= 1189.4 \text{ MeV} + 493.7 \text{ MeV} - 139.6 \text{ MeV} - 938.3 \text{ MeV} \\ &= 605 \text{ MeV} . \end{aligned}$$

(b) Similarly,

$$\begin{aligned} Q &= -\Delta m c^2 = (m_{\Lambda^0} + m_{\pi^0} - m_{K^-} - m_p)c^2 \\ &= 1115.6 \text{ MeV} + 135.0 \text{ MeV} - 493.7 \text{ MeV} - 938.3 \text{ MeV} \\ &= -181 \text{ MeV} . \end{aligned}$$