RLMSIS 2.0 models the global average density profile for the major constituents in Figure 1(a) and global average temperature profile in Figure 1(b). Table 4.6 below provides the electron-neutron collision frequencies. Use this information to answer the question on Page 2.
A solar flare event occurred at around 14:00 UT on 22 October 2014. A group of researchers from the Czech Republic have modeled the ionospheric effects from this event, as shown in Figure 2 (collision frequency on the left and electron density profile on the right). Solid lines represent modeled values before 14:00 and dashed lines the values during solar flare event.

**Question 1:** Use the quiet-condition electron density (solid blue line in Figure 1(a)) at 80 km and the neutral density information on Page 2 to estimate the electron collision frequency and compare it to Figure 2(b). Assume \( \nu_{en} = \nu_{e,N2} + \nu_{e,O2} \). Explain why your estimation is larger or smaller than Figure 2(b).

**Question 2:** Based on Figure 2, for an over-the-horizon radio system operating at 3 MHz, at what altitude will the radio wave be reflected by the ionosphere during the solar flare?