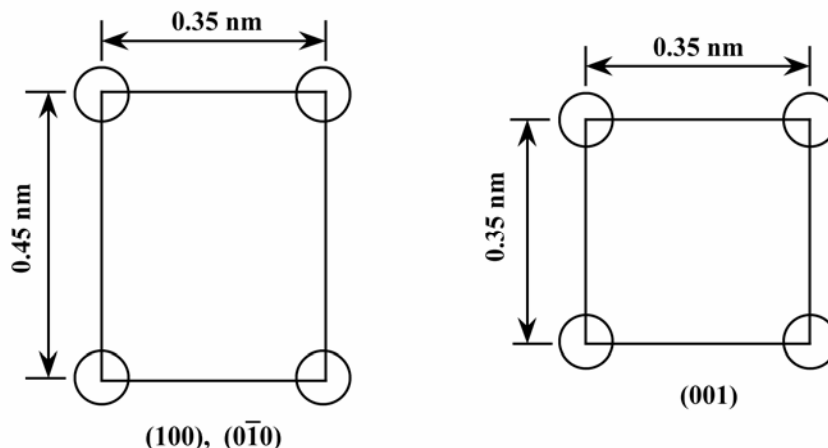3.45   (a)   The unit cell in Problem 3.20 is body-centered tetragonal. Of the three planes given in the problem statement the (100) and (0$\bar{1}$0) are equivalent—that is, have the same atomic packing. The atomic packing for these two planes as well as the (001) are shown in the figure below.

(100), (0$\bar{1}$0)

(001)

(b)   Of the four planes cited in the problem statement, only (101), (011), and ($\bar{1}$01) are equivalent—have the same atomic packing. The atomic arrangement of these planes as well as the (110) are presented in the figure below.   *Note:*   the 0.495 nm dimension for the (110) plane comes from the relationship $\left[(0.35 \text{ nm})^2 + (0.35 \text{ nm})^2\right]^{1/2}$. Likewise, the 0.570 nm dimension for the (101), (011), and ($\bar{1}$01) planes comes from $\left[(0.35 \text{ nm})^2 + (0.45 \text{ nm})^2\right]^{1/2}$.

(110)

(101), (011), ($\bar{1}$01)