
PROBLEM SET 1

Reading: Ashcroft and Mermin (AM) Chapter 28

Optional Reading: Marder Chapter 19

1. AM 28.1
2. Using the data given in AM Ch. 28, calculate the number of positive and negative carriers per cm^3 present at 300 K in pure Ge. (Note: It is crucial to count the various pockets and bands correctly. For the purposes of the problem, you may ignore the third hole band shown in AM Fig. 28.8, which since it is ~ 0.3 eV below the other two will not contribute appreciably. Treat the two hole bands as spherical with the effective masses given in AM.)