2.7

$$v_n = -\mu_n E = -710\,\frac{cm^2}{V-s}\,3000\,\frac{V}{cm} = -2.13x10^6\,\frac{cm}{s}$$

$$v_p = +\mu_p E = +260\,\frac{cm^2}{V-s}\,3000\,\frac{V}{cm} = +7.80x10^5\,\frac{cm}{s}$$

$$j_n = -qnv_n = -1.60x10^{-19}C\left(10^{17}\,\frac{1}{cm^3}\right)\left(-2.13x10^6\,\frac{cm}{s}\right) = 3.41x10^4\,\frac{A}{cm^2}$$

$$jp_n = qnv_p = 1.60x10^{-19}C\left(10^3\,\frac{1}{cm^3}\right)\left(7.80x10^5\,\frac{cm}{s}\right) = 1.25x10^{-10}\,\frac{A}{cm^2}$$

2.15

$$N_A > N_D:\ N_A - N_D = 4x10^{16} - 10^{16} = 3x10^{16}\ /\ cm^3 >> 2n_i = 2x10^{11}\ /\ cm^3$$

$$p = N_A - N_D = 3x10^{14}\ /\ cm^3 \ \mid\ n = \frac{n_i^2}{p} = \frac{10^{22}}{3x10^{16}} = 3.33x10^5\ /\ cm^3$$