Fundamentals of Nanoelectronics, II: Energy Band Model

Prof. Supriyo Datta

L2.6 Quiz

Answers

2.6. Electron density (n)

2.6a. A material with an energy momentum relation $E(p) = E_c + K p^a$, has an electron density function n(E) given by (d: number of dimensions, K: positive constant)

(a) $n(E) \sim (E - E_c)^{(d-1)/a}$

(b) $n(E) \sim (E - E_c)^{d/a}$

(c) $n(E) \sim (E - E_c)^{(d+1)/a}$

(d) $n(E) \sim (E - E_c)^{(d/a)-1}$

(e) none of the above

$n(E) \sim p^d \sim (E - E_c)^{d/a}$

2.6b. A material with an energy momentum relation $E(p) = E_n - K p^a$, has an electron density function n(E) given by (d: number of dimensions, K: positive constant))

(a) $n(E) \sim (E_n - E)^{(d-1)/a}$

(b) $n(E) \sim (E_n - E)^{d/a}$

(c) $n(E) \sim (E - E_n)^{d/a}$

(d) $n(E) \sim (E - E_n)^{(d-1)/a}$

(e) none of the above

$n(E) \sim p^d \sim (E_n - E)^{d/a}$