Fundamentals of Nanoelectronics, II: Energy Band Model

Prof. Supriyo Datta

L1.10 Quiz

Answers

1.10. Summing up ..

One way to sum up the new perspective is to write the conductivity as the product of the ballistic conductance per unit area G_B / A and the mean free path l :

$$s(E) = \frac{G_B}{A} l$$

1.10a. The ballistic conductance per unit area G_B / A is proportional to

(a) density of states D(E) divided by the magnitude of the velocity $n(E)$

(b) density of states D(E) times the magnitude of the velocity $n(E)$

(c) density of states D(E) only, independent of the velocity $n(E)$

(d) density of filled states

(e) density of empty states

1.10b. The mean free path l is proportional to

(a) the velocity $n(E)$ divided by the mean free time $t(E)$

(b) the cross-sectional area A divided by the length of the channel L

(c) the length L of the channel

(d) the velocity $n(E)$ times the mean free time $t(E)$

(e) none of the above