Fundamentals of Nanoelectronics, I: The New Perspective

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L1.6 Quiz

Answers

1.6. Diffusive (D) Conductance

1.6a. The time it takes an electron to cross a conductor of length L in the diffusive regime is proportional to

(a) $\sim L$

(b) $\sim L^2$

(c) $\sim L^3$

(d) $\sim 1/L$

(e) $\sim \ell n\, L$

1.6b. The conductivity σ is related to the diffusion coefficient $\bar{D}$ and the density of states per unit volume (D/AL) by the relation

(a) $\sigma = q^2 \frac{D}{AL} \bar{D}$

(b) $\sigma = q^2 \frac{D}{AL} \frac{1}{\bar{D}}$

(c) $\sigma = \frac{D}{AL} \frac{1}{q^2 \bar{D}}$

(d) $\sigma = \frac{AL}{q^2 \bar{D} D}$

(e) None of the above