Fundamentals of Nanoelectronics, II: Energy Band Model Prof. Supriyo Datta L2.3 Quiz <u>Answers</u>

2.3. Counting States

2.3a. In a 1D box of length L with periodic boundary conditions, the allowed values of the momentum p are spaced by

(a) $\frac{h}{L}$ (b) $\frac{2p}{L}$ (c) $\frac{h}{L^2}$ (d) $\frac{h}{2L}$

(e) None of the above

2.3b. The number of states N(p) with momentum less than p in a conductor is given by (d: number of dimensions)

- (a) $N(p) \sim p$ (b) $N(p) \sim p^d$
- (c) $N(p) \sim p^2$
- (d) $N(p) \sim p^{d/2}$
- (e) None of the above