List of Figures:

1. Figure 1.1: Simplified diagram of the electronic band structure of metals, semiconductors and insulators.

2. Figure 2.1: Two dimensional arrangements of atoms at lattice sites.

3. Figure 2.2: Ideal periodic square well potential suggested by Kronig and Penney.

4. Figure 2.3: Plot of $\frac{\gamma^2 d}{2\alpha} \sin(\alpha a) + \cos(\alpha a) \cos(ka)$.

5. Figure 2.4: Energy Vs wave vector for a one dimensional lattice.

6. Figure 3.1: Graphical form of the Pöschl-Teller potential.

7. Figure 4.1: Graphical form of the Scraf potential.

8. Figure 5.1: Variation of $m_0(m_0 - 1)$ Vs $m$ together with $j(j+1)$.

9. Figure 5.2: Energy band diagram.