a. If $T(n) \in \Theta(n^2)$, then $\Rightarrow T(n) \in O(n^2)$ and $T(n) \in \Omega(n^2)$. $T(n) = 6n^2+4n+3$

i. [For O(n)] $T(n) \leq C(g(n))$ for all $n \geq n_0$

1. $6n^2+4n+3 \leq Cn^2 \quad \forall\ n \geq n_0$ //Find C and n_0
2. $T(1) = 6(1)^2 + 4(1) + 3 \leq C(1)^2 \quad \forall\ n \geq 1$
3. $6+4+3 = 13 \Rightarrow 13 \leq C \quad \forall\ n \geq 1$
4. $C = 13$ and $n_0 = 1$

ii. [For Ω(n)] $T(n) \geq C(g(n))$ for all $n \geq n_0$

1. $6n^2+4n+3 \geq Cn^2 \quad \forall\ n \geq n_0$ //To find C and n_0 I will set n=1
2. $6(1)^2 + 4(1) + 3 \geq C(1)^2 \quad \forall\ n \geq 1$
3. $13 \geq C \quad \forall\ n \geq 1$
4. $C = 13$ and $n_0 = 1$

b. $O(n^4)$ is NOT a tight upper bound for T(n). Since we know that $T(n) \in \Theta(n^2)$, then that implies that the tight upper bound is $O(n^2)$.

c. $\Omega(n)$ is NOT a tight lower bound for T(n) because we can prove that $\Omega(n^2)$ is a lower bound for T(n). Since $T(n) \in \Theta(n^2)$, that means that the tight lower bound is $\Omega(n^2)$.