7 (a) Let Estimate be E.

$$E = \left| \int_a^b f(x)dx - T(h) \right|$$

$T(h) \rightarrow$ step size $h = (b-a)/N$.

$\therefore$ we know that

$$E_h = I(f) - T_n(f)$$
$$= -\frac{h^2}{12}(b-a) f''(\theta)$$

$\therefore \hat{f}(x) = f(x) + \delta(x)$

$$E'_h = I(f) - T_n(\hat{f})$$
$$= I(f) - T_n(f) - \frac{h}{2} \sum_{i=0}^{n-1} \left(\delta(x_i) + \delta(x_{i+1}) \right)$$
$$= E_h(f) - \frac{h}{2} \sum_{i=0}^{n-1} \left(\delta(x_i) + \delta(x_{i+1}) \right)$$

$$\Rightarrow E'_h = -\frac{h^2}{12}(b-a) f''(\theta) - \frac{h}{2} \sum_{i=0}^{n-1} \left(\delta(x_i) + \delta(x_{i+1}) \right)$$

$$\Rightarrow \left| E'_h \right| \le \frac{h^2}{12}(b-a) \| f''(\theta) \|_\infty + (b-a)\delta$$

$\because |\delta(x_i)| \le \delta \ \forall x_i$.