7b) $\left|\det \nabla^2 f(t) - \det \nabla^2 f(t_0)\right|$

$$= \left| \sum_{\sigma \in S_n} s(\sigma) \left(\prod_{i=1}^{n} \nabla^2 f(t)_{i\sigma(i)} - \prod_{i=1}^{n} \nabla^2 f(t_0)_{i\sigma(i)} \right) \right|$$

$$= \left| \sum_{\sigma \in S_n} s(\sigma) \left(\sum_{j=2}^{n} \left(\prod_{i=1}^{n} \nabla^2 f(t)_{1\sigma(1)} \cdots \nabla^2 f(t)_{j\sigma(j)} \, \nabla^2 f(t_0)_{j+1\,\sigma(j+1)} \text{ --- } \nabla^2 f(t_0)_{n\sigma(n)} \right.\right.\right.$$

$$\left.\left.\left. - \prod \text{ --- } \nabla^2 f(t)_{j-1\,\sigma(j-1)} \, \nabla^2 f(t_0)_{j\sigma(j)} \text{ --- } \nabla f(t_0) \right) \right) \right|$$

$$= \left| \sum_{\sigma \in S_n} s(\sigma) \left(\sum_{j=2}^{n} \left(\prod(\,) \left(\underbrace{\nabla^2 f(t)_{j\sigma(j)} - \nabla^2 f(t_0)_{j\sigma(j)}}_{} \right) \right) \right) \right|$$

$$\leq \sum_{\sigma \in S_n} \sum_{j=2}^{n} \left(\prod |\;| \; \underbrace{\left| \nabla^2 f(t)_{j\sigma(j)} - \nabla^2 f(t_0)_{j\sigma(j)} \right|}_{\leq L_{j\sigma(j)} \|t - t_0\|} \right)$$