Notations and Conventions

Throughout the thesis, we adhere to the following notations and conventions :

R = The set of real numbers.

m^*E = The outer Lebesgue measure of a set E.

mE = The Lebesgue measure of a set E.

$\emptyset$ = The empty set.

(a,b) = The open interval $a < x < b$, $a,b \in R$.

$[a,b]$ = The closed interval $a \leqslant x \leqslant b$, $a,b \in R$.

$(a,b]$ = The semi closed interval $a < x \leqslant b$, $a,b \in R$.

$[a,b)$ = The semi closed interval $a \leqslant x < b$, $a,b \in R$.

$E' = [a,b] - E$ for a set $E \subset [a,b]$.

$F^{(n)}$ = The nth derivative of a function F.

Unless otherwise mentioned, f,g etc. are extended real valued functions defined on $[a,b]$ and F,G etc. are real valued functions defined on [a,b] and the sets and points are contained in [a,b].

If a property P is satisfied at all points of a set A except a countable subset (resp. a subset of measure zero), then it is said that P is satisfied nearly everywhere (resp. almost everywhere) or, in short, n.e. (resp. a.e.) on A.

If a function f is Lebesgue integrable (L-integrable) on [a,b], then

$$\int_a^b f$$

denotes its definite Lebesgue integral on [a,b].

For a function F on a set E, O(F;E) denotes the oscillation of F on E.

By a set, we mean a subset of R.