

PREFACE

The works of the thesis, arranged in four chapters, deal with generalized limit, continuity, derivatives and integrals for extended real valued functions of a real variable.

In chapter I, the concepts of uniform and non-uniform Cesàro-differentiability on an interval and at a point are introduced. Among other things, we prove, for a Cesàro-differentiable function F , the set of points of non-uniform Cesàro-differentiability of F on a closed interval $[a, b]$ is of the first category. We also prove Clarkson's property for the Cesàro-derivatives. The contents of this chapter form the subject matter of our papers :

(i) On the Cesàro derivatives, Soochow J. Math. 13, No. 2 (1987), p. 149 - 158

(ii) Some results on Cesàro-derivative, Soochow J. Math. 14, No. 1 (1988), p. 57 - 63.

Sargent (1941) has shown that the $C_\lambda D$ -integral is equivalent to the $C_\lambda P$ -integral of Burkill (1935). But there is a defect in the proof of the result : the $C_\lambda P$ -integrability \implies the $C_\lambda D$ -integrability. A correct proof has been given by

Verblunsky (1971). In chapter II, we give two different proofs of this result. The first of these two proofs forms the subject matter of our paper . On the Cesàro-Perron integrals (accepted for publication in Bull. Austral. Math. Soc).

In chapter III, we introduce the notions of Modified Cesàro-limit, Modified Cesàro-continuity and Modified Cesàro-derivates. We show that the Modified Cesàro-continuity is substantially more general than the approximate continuity. Among other results, we prove that the Modified Cesàro-continuous functions and Modified Cesàro-derivatives are Darboux.

In chapter IV, we introduce the Modified Cesàro-Perron-integral ((MCP)-integral) and study its different properties. We show that the Cauchy and Harnack type properties are possessed by the (MCP)-integral.

In fine, I tender my grateful thanks to the University of North Bengal for awarding me a U.G.C. Research Fellowship. I also express my warmest thanks to the authors of the books and papers referred to in pages 184 - 200 whose expositions have helped me to complete the work.

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