

## P R E F A C E

The present work is the outcome of the research carried out by me in the field, "On Some Integral Transforms of Generalized Functions And Their Applications" at Marathwada University, Aurangabad, Institute of Science Bombay, Institute of Science, Aurangabad and Jai Hind College, Dhule.

This thesis consists of eight chapters and each is divided into several sections. The first chapter is devoted to the historical survey of literature in the context of the research work accomplished in the subsequent chapter of this thesis.

In the second chapter the Laplace-Hardy transformation  $LC_{\nu}$ , has been extended to a certain class of generalized functions. Analyticity theorem, order property and boundedness theorem for distributional Laplace-Hardy  $LC_{\nu}$  transformation have been developed.

The third chapter represents the inversion formula and uniqueness theorem for the generalized Laplace-Hardy  $LC_{\nu}$  transformation. The six lemmas that are required for the proof of inversion formula have also been established. Some operational transform formulae have been obtained for the generalized Laplace-Hardy  $LC_{\nu}$  transformation.

In the fourth chapter a representation theorem for the Laplace-Hardy  $\mathcal{L}C_\nu$  transformable generalized functions has been obtained.

In chapters fifth to seventh, the Laplace-Hardy  $\mathcal{L}F_\nu$  transformation have been extended to a certain class of generalized functions. The inversion formula, uniqueness theorem and the representation theorem for the Laplace-Hardy  $\mathcal{L}F_\nu$  transformable generalized functions have been proved.

In the eighth chapter a physical problem has been solved by the application of Laplace-Hardy  $\mathcal{L}C_\nu$  transform of generalized functions.

In the end, Appendices I and II are added which consists of useful definitions, results and symbols, used throughout the present thesis. The list of research papers accepted/published are given in Appendix III.

A triple number system is used for all lemmas, theorems, corollaries, formulae and examples. For example, 2.3.4 is the fourth lemma appearing in the section three of the second chapter. References are given at the end of each chapter and they are arranged in the alphabetical order, in the text, they have been referred to, by putting within rectangular brackets. The serial number of the reference that is [5, pp.49] means that the page 49 of the fifth reference.