

## PREFACE

*The present thesis entitled "SOME INVESTIGATION ON SUMMABILITY AND APPROXIMATION OF FOURIER SERIES AND ALLIED SERIES" is the outcome of my researches which I have been doing since 5<sup>th</sup> May 2005 in the Department of Mathematics, S. G. R. P. G. College, Dobhi, Jaunpur in the 'Summability theory and Approximation' under the esteemed supervision and able guidance of Dr. K.N.Singh, Reader, Department of Mathematics, S.G.R.P.G. College, Dobhi, Jaunpur (U.P.).*

*In all, there are ten chapters in the present thesis. In the first chapter, which is introductory, I have made an attempt to make a brief account of the existing results and basic definitions which have inter connections with my investigations. In chapter II, I have established two theorems on almost  $(\bar{N}, p_n)$  summability of Fourier series and its conjugate series. Chapter III, I have obtained a result on the study of derived series of a Fourier series and allied series by almost Nörlund summability method. Chapter IV is devoted to the study of almost  $(N, p, q)$  summability of derived Fourier series. In chapter V, on almost Euler summability of a Fourier series and in chapter VI, I have established a theorem on uniform triangular matrix summability of Legendre series. Chapter VII contains a theorem on matrix - Cesàro summability of Fourier coefficients while in chapter VIII a theorem on the double matrix summability of double Fourier series has been studied. In chapter IX, I hav*

*discussed on the study of Jacobi series. In the last chapter X, I have obtained a theorem on the degree of approximation of functions belonging to the class  $Lip(\alpha, p)$ . At the end, I have given a complete bibliography of the works to which references have been made in this thesis.*

*By far, a good portion of this thesis has been accepted for publication in the form of research papers in reputed Scientific Journals and some of them have already been either published, or, are in course of publication. A detailed account of the same is being given as under :*

- 1. On almost  $(N, p_n)$  summability of Fourier series and conjugate series, Acta Ciencia Indica, Vol. XXXIIM, No. 3, 1221-1226 (2006).*
- 2. On almost Euler summability of a Fourier series, Indian Academy of Mathematics, JIAM Vol. 30, No. 1 (2008).*
- 3. On uniform triangular matrix summability of Legendre series, Acta Ciencia Indica, Vol. XXXII M, No. 4, 1443-1450 (2006).*
- 4. On almost  $(N, p, q)$  summability of derived Fourier series, Indian Academy of Mathematics.*
- 5. On the degree of approximation of function on belonging to the class  $Lip(\alpha, p)$ , Acta Ciencia Indica.*

*I have received reprints and acceptance letter of above mentioned papers and also attached them in the form of appendix at the end of this thesis.*

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