PREFACE

The present thesis entitled "ON THE CONVERGENCE AND SUMMABILITY OF FOURIER-BESSEL SERIES" is the outcome of the researches carried out by me, since October 1972, under the supervision of Dr. C. M. Patel, M. Sc., Ph. D., Reader in Mathematics, Faculty of Technology & Engineering, The M. S. University of Baroda, Baroda.

I feel great pleasure in acknowledging my indebtedness to him for his very inspiring and valuable guidance throughout this period. It is very kind of him that he has always been available, as and when I needed him, and all this time he extended his helping hand in an unassuming and friendly manner.

The thesis consists of nine chapters. In chapter I, the importance of different types of series, discussed in the text, has been shown as applied to various physical problems. The basic definitions and properties of Bessel functions connected with the work and a historical survey of the results connected with my investigations has been presented. The chapters II and III deal with certain properties leading to uniform convergence and uniform convergence of Fourier-Bessel series.

Chapter IV consists of results on mean convergence of Fourier-Bessel series and their divergence. The treatment of this chapter has not been kept devoid of the Functional Analysis approach, whenever necessary. The degree of approximations of partial sums of certain Fourier-Bessel series has been discussed in chapter V. Chapter VI incorporates with the order of coefficients of a Fourier-Bessel series of special kind. The equi-convergence of Fourier-Dini series and Fourier-trigonometric series corresponding to a function is the subject of chapter VII.

Some higher order Riesz-means for a series of Bessel functions have been dealt with in chapter VIII. Interesting conclusions have been drawn regarding representation of the series as Fourier-Bessel series of functions of certain classes and uniform and uniform and absolute convergence of the series. In the last chapter, a Fourier-Bessel series of special kind has been considered for convergence and Riesz summability.

A fairly complete bibliography of the relevant available literature on the subject has been given at the end.

A great part of the work has either been published or has been accepted for publication in various journals of repute in India and abroad. The remaining work has also been communicated for publication.

It is with a deep sense of gratitude that I express my indebtedness to Dr. U. N. Singh, M. A., D. Phil., Dr. ès Sc., Pro-vice Chancellor, University of Delhi, Delhi, but for whose inspiration and kind hearted support, it would not have been possible to carry out this work. I am also thankful to Dr. V. M. Shah, M. Sc., Ph. D., Professor and Head, Department of Mathematics, Faculty of Science and to Professor C. G. Shah, M. Sc., Professor and Head, Department of Mathematics, Faculty of Technology and Engineering, The M. S. University of Baroda, Baroda, who have not only imparted to me all help from the financial resources available in the departments but also have extended their personal support, by giving their valuable suggestions from time to time, academically as well as morally.

In the end, I wish to record my thanks to the University Grants Commission for the financial assistance given to me from time to time to carry out this work and to my various friends and colleagues who have rendered their invaluable help in completing this work.

Department of Mathematics,
Faculty of Science,
The M.S.University of Baroda,
Baroda-390002 (INDIA).

S. R. Agrawal

(SITA RAM AGRAWAL)

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