Preface

The present thesis entitled "A SYSTEM OF p-POLYNOMIALS AND ITS q-ANALOGUE" incorporates the investigation carried out by me under the able guidance of Dr. B. I. Dave, Professor, Department of Mathematics, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara.

The subject matter of the thesis is to propose the general classes of p-polynomials with the properties such as the inverse series relation, differential equation, generating function relations, summation formulas and the Companion matrix, along with their basic analogues.

There are total nine chapters in the thesis.

Chapter 1 which introduces the subject matter, contain certain results, definitions, formulas and the notations.

Chapter 2 contain the p-deformed generalized Humbert polynomials, the p-deformed Wilson polynomials and the p-deformed Racah polynomials with their particular cases along with the properties like the inverse series relation, differential equation, recurrence relations, generating function relations, summation formulas and the Companion matrix.

In chapter 3, we define the basic analogues of the p-polynomial considered in chapter 2; as the p-deformed generalized q-Humbert polynomial, the p-deformed Askey-Wilson polynomials and the p-deformed q-Racah polynomials together with their properties like the inverse series relation, summation formulas and the Companion matrix. The particular polynomials belonging to these general polynomials are illustrated along with the corresponding properties.

The aim of chapter 4 is to extend the p-Wilson polynomials and the p-Racah polynomials in the degree $\lfloor n/m \rfloor$. A general class of polynomials is also introduced here. For these polynomials, the inverse series relation, generating function relations, summation formulas and the Companion matrix are obtained.

The basic analogues of p-polynomials of chapter 4 are derived in chapter 5. The properties, analogous to the earlier chapters, are derived for these basic polynomials.

The objective of chapter 6 is to extend a known general class of polynomials in p-deformed sense and to derive the aforementioned properties.

The basic analogue of this general class is defined and the corresponding properties are obtained in chapter 7.

Using the general inversion pairs of chapters 2 and 4, the p-deformed Riordan's classification of inverse pairs are derived in chapter 8.

The basic analogues of the p-deformed Riordan's classes are derived in chapter 9 with the help of the general inversion pairs of the chapters 3, 5 and 7.

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