As the title suggests, in the present thesis an attempt has been made to discuss some problems of hypergeometric polynomials. This thesis comprises of eight chapters. A brief summary of problems is presented at the beginning of each chapter and then each chapter is divided in a number of sections. Definitions and equations have been numbered chapter wise. The section number is followed by the number of equation. For example (4.3.2) refers to equation number 2 of section 3 of chapter 4.

A brief review of some important special functions, some integral transforms, operators, formulae, the definitions, notations and various results, which commonly arise in practice and explore many of their salient properties, are given in first chapter.

Chapter II introduces modified Hermite polynomials of one and two variables, denoted by $H_n(x; a)$ and $H_n(x, y; a)$. The aim of the present chapter is to investigate these two polynomials and acquire some important results such as generating functions, recurrence relations, Rodrigues formula, orthogonality conditions, expansion formulae, integrals, fractional integrals, fractional derivatives, operator representations and other properties of the above polynomials.

Chapter III deals with the study of a new two variables analogue of modified Hermite polynomials $\tilde{H}_n(x, y; a)$ whose special Hermite polynomials $\tilde{H}_n(x, y)$ seems more natural than that of Hermite polynomials of two variables defined and studied by Khan, M.A. and Abukhammash, G.S. [19]. A systematic analysis of the above polynomials gives us various unknown results such as generating functions, recurrence relations, Rodrigues formula, relationship with Hermite and Legendre polynomials of one variable, some special properties and expansion of Legendre polynomials in terms
of modified Hermite polynomials of two variables.

In chapter IV, a study has been made of a new three and m-variable analogue of Hermite polynomials of first kind whose two variable analogue seems more natural than that of Hermite polynomials of two variables defined and studied by Khan, M.A. and Abukhammash, G.S. [19]. This chapter contains generating functions, recurrence relations, Rodrigues formula, relationship with Hermite polynomials of one variable, some special properties and expansion of Legendre polynomials in terms of Hermite polynomials of three and m-variables.

Chapter V concerns with the study of a new three and m-variable analogue of Hermite polynomials of second kind whose two variable analogue seems more natural than that of Hermite polynomials of two variables defined and studied by Khan, M.A. and Abukhammash, G.S. [19] and gives some unknown results such as generating functions, recurrence relations, Rodrigues formula, relationship with Hermite polynomials of one variable, some special properties and expansion of Legendre polynomials in terms of Hermite polynomials of three and m-variables.

Chapter VI gives an extension of certain results obtained by Burchnall, J.L. for Hermite polynomials to similar results for Hermite polynomials of several variables.

The chapter VII deals with a study of Bedient polynomials and gives us a systematic analysis of various unknown results for Bedient polynomials such as generating integrals, operational representations, fractional integrals, fractional derivatives, hypergeometric representations, Laplace transforms, Mellin transforms and relationship with generalized Rice polynomials.

In the last chapter we study the Bedient polynomials of two, three and m-variables and discover a systematic analysis of various unknown results for Bedient polynomials of two, three and m-variables such as generating integrals, generating functions and relationship of Hermite, Legendre and Gegenbauer polynomials with Bedient polynomials.

In the end an exhaustive and up to date list of original papers related to the
subject matters of this thesis have been provided in the form of a bibliography.

A part of our research work has been Published/Accepted/Communicated for publication in the form of various research papers as listed below:

**Papers Published**


**Papers Accepted**


**Papers Communicated for Publication**

1. A note on modified Hermite polynomials of two variables.

2. A note on a new two variable analogue of Hermite polynomials.

3. A note on a new m-variable analogue of Hermite polynomials of first kind.

4. A note on Hermite polynomials of several variables.

5. A study of Bedient polynomials.
(6) A study of Bedient polynomials of two variables.

(7) A study of Bedient polynomials of three and m-variables.