

EXTENSION OF GENERAL CLASS OF GENERATING
FUNCTIONS AND ITS APPLICATIONS-I

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Abstract: In this paper, we introduce a general class of generating functions involving the triple product of modified Laguerre polynomials $L_n^{(\alpha-n)}(x)$, modified Jacobi polynomials $P_m^{(\alpha, \beta-m)}(q)$ and the confluent hypergeometric functions ${}_1F_1[.]$ and then obtain its some more general class of generating functions by group-theoretic approach and discuss their applications. Earlier Bhandari [1] introduce a general class of generating functions involving the product of modified Jacobi polynomials $P_n^{(\alpha, \beta-n)}(x)$ and the confluent hypergeometric functions ${}_1F_1[.]$.

Keywords and Phrases: Generating functions, Modified Laguerre polynomials, Modified Jacobi polynomials, Confluent hypergeometric functions.

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1. Introduction

The modified Laguerre polynomials $L_n^{(\alpha-n)}(x)$ and modified Jacobi polynomials $P_m^{(\alpha, \beta-m)}(q)$ are defined by Srivastava and Manocha [5] as:

$$L_n^{(\alpha-n)}(x) = \frac{\Gamma(1+\alpha)}{\Gamma(1+n)\Gamma(1+\alpha-n)} {}_1F_1[-n; 1+\alpha-n; x] \quad (1.1)$$

$$P_m^{(\alpha, \beta-m)}(q) = \frac{(1+\alpha)_m}{m!} {}_2F_1\left[-m, 1+\alpha+\beta+m; 1+\alpha; \frac{1-q}{2}\right] \quad (1.2)$$