

ON MIXED TRILATERAL GENERATING RELATIONS OF LAGUERRE POLYNOMIALS

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Dedicated to Prof. A.M. Mathai on his 80th birth anniversary

Abstract: In this paper we adopt group theoretic method to obtain mixed trilateral generating relations by involving Laguerre polynomial with the use of linear partial differential operators from the existence of bilinear generating relations.

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1. Introduction

The Laguerre polynomials $L_n^\alpha(x)$ satisfy the following differential equation :

$$x \frac{d^2y}{dx^2} + (1 + \alpha - x) \frac{dy}{dx} + ny = 0 \quad (1.1)$$

[cf. Majumdar [1]]

where n is not necessarily a non-negative integer.

The main object of the present paper is to derive some mixed trilateral generating relations by using the linear partial operators.

2. Main Results

Theorem 1 If there exists a bilinear generating relation of the form

$$G(x, u, w) = \sum_{n=0}^{\infty} a_n L_n^{(\alpha)}(x) L_n^{(\alpha)}(u) w^n \quad (2.1)$$