

Linear Generating Relations and Hypergeometric Transformations

M.I. Qureshi, Deepak Kumar Kabra* and M. S. Baboo**

Department of Applied Sciences and Humanities

Faculty of Engineering and Technology

Jamia Millia Islamia (A Central University)

New Delhi - 110025, India

E-mail: miqureshi delhi@yahoo.co.in

*Department of Mathematics

Govt. College Kota, University of Kota

Kota, Rajasthan- 324001, India

E-mail: dkabra20@gmail.com

**Department of Applied Sciences and Humanities

Knowledge park - III, Sharda University

Gr. Noida, U.P. - 301206, India

E-mail: mesub007@gmail.com

Abstract:

The main object of this paper is to obtain four linear generating relations for generalized Hermite polynomials of Dickinson-Warsi and two hypergeometric transformations for Gauss's ordinary hypergeometric function, using Barr's identity and Carlitz's generating relations.

Keywords and Phrases:

Linear generating relations, Generalized (Associated or Sonine) Laguerre polynomials, Generalized Hermite polynomials, Hypergeometric transformations.

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1- Introduction and Preliminaries :

It is well known that the Hermite polynomials $H_n(x)$ can be entirely reduced to the associated Laguerre polynomials $L_n^{(a)}(x)$ with the parameters $a = \pm\frac{1}{2}$ by means of the formulas[7,p.216(Q.1); 9,p.106(5.6.1)]

$$H_{2n}(x) = (-1)^n 2^{2n} (n)! L_n^{(-\frac{1}{2})}(x^2) \quad (1.1)$$

$$H_{2n+1}(x) = (-1)^n 2^{2n+1} (n)! x L_n^{(\frac{1}{2})}(x^2) \quad (1.2)$$