Journal of Pure Mathematics

ISSN 2277-355X

Department of Pure Mathematics
University of Calcutta
35, Ballygunge Circular Road, Kolkata 700019,
INDIA

Jour. Pure Math., Vol. 26, 2009, pp. 1-13

ON SOME MULTIVARIABLE GENERALIZED TRUESDELL POLYNOMIALS

R. C. Singh Chandel & S. S. Chauhan

ABSTRACT : Motivated by the work of Chandel and Tiwari [1] and Singh [2], here in the present paper we introduce and study multivariable generalized Truesdell polynomials defined by (1.3). Its further generalization will also be discussed.

Key words : Generalized Truesdell polynomials, multivariable analogues, Generating relations, Rodrigues formula, Pure Recurrence relations, Differential Recurrence Relations.
2000 Mathematics Subject Classification. 33C65, Secondary 33C70.

1. INTRODUCTION

Chandel and Tiwari [1] introduced multivariable analogue of Hermite polynomials defined by Rodrigues' formula :

$$(1.1)\qquad H_{n_1,\ldots,n_m}^{(b;\,h_1,\ldots,h_m;\,r_1,\ldots,r_m)}(x_1,\ldots,x_m) = (-1)^{n_1+\ldots+n_m}\left(1+h_1x_1^{r_1}+\ldots+h_mx_m^{r_m}\right)^b$$

$$\frac{d^{n_1}}{dx_1^{n_1}}\cdots\frac{d^{n_m}}{dx_m^{n_m}}\left(1+h_1x_1^{r_1}+\ldots+h_mx_m^{r_m}\right)^{-b}$$

where $n_1,\ldots,n_m$ are positive integers, while $h_1,\ldots,h_m$, $r_1,\ldots,r_m$ are any numbers real or complex independent of $x_1,\ldots,x_m$.

Singh [2] introduced generalized Truesdell polynomials by the Rodrigues' formula :

$$(1.2)\qquad T_n^{\alpha}(x,r,p) = x^{-\alpha}e^{px^r}\delta^n\left(x^{\alpha}e^{-px^r}\right),\ \delta \equiv x\frac{\partial}{\partial x}$$

where n is positive integer and α, p, r are arbitrary numbers real or complex independent of x.

Motivated by the above work [1,2], here in the present paper, we introduce and study