Annexure N. - 22

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20

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NEW MULTIVARIABLE ANALOGUE OF PANDA'S POLYNOMIALS

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ABSTRACT

In the present paper, motivated by earlier work of the auther (45 (2015), 95-102) On multivariable analogue of a class of polynomials of Chandel and Chandel and On New class of polynomials, *Glasgow Math. J.* (18 (1977), 105-108) by R. Panda and A multivariable analogue of Panda's polynomials, *Indian. J. Pure Appl. Math.*, (21 (12) (1990), 1101-1106 by R.C.S. Chandel and S. Sahgal; we introduce new multivariable analogue of Panda's polynomials and interesting special cases are also discussed in details. **2010 Mathematical Subject Classification** : 33C50

Keywords. Multivariable Analogue, Panda's polynomials, Chandel and Chandel polynomials, Chandel and Sahgal Multivariable analogue.

1. Introduction.

Panda [7] introduced a new class of polynomials defined by generating function :

(1.1) $$(1-t)^{-c} G\left[\frac{xt^s}{(1-t)^r}\right] = \sum_{n=0}^{\infty} g_n^c(x,r,s)\, t^n,$$

where

(1.2) $$G(z) = \sum_{n=0}^{\infty} \gamma_n z^n, (\gamma_0 \neq 0),$$

c is arbitrary parameter, r is any integer positive or negative and $s=1,2,3,\ldots$.

Further for $\gamma_n = \dfrac{1}{n!}$, Sinha [8] studied the special case of above polynomials defined by

(1.3) $$(1-t)^{-c} \exp\left\{\frac{xt^r}{(1-t)^r}\right\} = \sum_{n=0}^{\infty} E_n^c(x,r,s)\, t^n$$

in different notation (see Chandel's Corrigendum [2]).

Recently, Chandel and Sahgal [3] introduced a multivariable analogue of Panda's polynomials [7], defined by

(1.4) $$(1-t_1)^{-c_1}\ldots(1-t_m)^{-c_m}\left[1-\frac{x_1 t_1^{s_1}}{(1-t_1)^{r_1}}-\ldots-\frac{x_m t_m^{s_m}}{(1-t_m)^{r_m}}\right]^{-b}$$

$$= \sum_{n_1,\ldots,n_m=0}^{\infty} \Gamma_{n_1,\ldots,n_m}^{(b;c_1,\ldots,c_m;r_1,\ldots,r_m;s_1,\ldots,s_m)}(x_1,\ldots,x_m)\, t_1^{n_1}\ldots t_m^{n_m}$$

where b, $c_1,\ldots,c_m$; are any parameters; $r_1,\ldots,r_m$; are any integers positive or negative, while $s_1,\ldots,s_m$ are any positive integers.

They also discussed generalization of (1.4) as

(1.5) $$(1-t_1)^{-c_1}\ldots(1-t_m)^{-c_m}\, G\left[\frac{x_1 t_1^{s_1}}{(1-t_1)^{r_1}}+\ldots+\frac{x_m t_m^{s_m}}{(1-t_m)^{r_m}}\right]$$

$$= \sum_{n_1,\ldots,n_m=0}^{\infty} G_{n_1,\ldots,n_m}^{(c_1,\ldots,c_m;r_1,\ldots,r_m;s_1,\ldots,s_m)}(x_1,\ldots,x_m)\, t_1^{n_1}\ldots t_m^{n_m}$$

where $c_1,\ldots,c_m$; are any parameters independent of $x_1,\ldots,x_m$; $r_1,\ldots,r_m$; are any integers positive or negative while $s_1,\ldots,s_m$ are positive integers and $x_1,\ldots,x_m$ are any variables real or complex and $G(z)$ is given by (1.2)

89