South East Asian J. of Math. & Math. Sci. **ISSN : 0972-7752**
Vol.11, No.1 2015, pp. 107-114

On Certain New Bailey Pairs and Their Applications

K.B. Chand, G.S. Pant and V.P. Pande*
Department of Mathematics,
S.S.J. College, Almora (U.K.) India
*Prof & Head, Department of Mathematics,
S.S.J. College, Almora (U.K.) India

Abstract: In this paper, we have established certain new Bailey pairs which have been used to obtain transformation formulae for q-series.
Keywords and phrases: Bailey pair, q-series, transformation formula.
2000 A.M.S. subject classification: Primary 33D15, 33D90, 11A55, Secondary 11F20, 33F05

1. Introduction, Notations and Definitions

In the present paper, we shall adopt the following notations and definitions. The q-rising factorial is defined by, for $|q| < 1$,

$$[a;q]_n = (1-a)(1-aq)...(1-aq^{n-1}), \qquad n = 1,2,3,...,$$

$$[a;q]_0 = 1,$$

$$[a;q]_\infty = \prod_{r=0}^{\infty}(1-aq^r)$$

and

$$[a_1,a_2,...,a_r;q]_n = [a_1;q]_n[a_2;q]_n...[a_r;q]_n.$$

A basic hypergeometric series (q-series) is defined by,

$${}_r\Phi_s\left[\begin{array}{l} a_1,a_2,...,a_r;q;z \\ b_1,b_2,...,b_s;q^\lambda \end{array}\right] = \sum_{n=0}^{\infty}\frac{(a_1,a_2,...,a_r;q)_n z^n q^{\lambda\binom{n}{2}}}{(q,b_1,b_2,...,b_s;q)_n}, \qquad (1.1)$$

where $\binom{n}{2} = n(n-1)/2$. Series (1.1) converges for all values of z if λ is a positive integer. For $\lambda = 0$, it converges for $|z| < 1$.