J. of Ramanujan Society of Math. and Math. Sc. **ISSN : 2319-1023**
Vol.5, No.2 (2016), pp. 47-56

ON CERTAIN DOUBLE SERIES IDENTITIES

K.B. Chand, V.P. Pande and Mohammad Shahjade*

Department of Mathematics,
S.S.J. College, Almora (U.K.) India

*Department of Mathematics,
MANUU (Central University), Poly. 8th Cross,
1st Stage, 3rd Block, Nagarbhavi, Bangalore -560072, India.

E-mail:- gspant2070@rediffmail.com, mohammadshahjade@gmail.com

Abstract: In this paper, making use of Bailey transform and WP-Bailey transform, certain double series identities of Rogers-Ramanujan type have been established.

Keywords and Phrases: Bailey pair, WP-Bailey pair, identities, double series identities.

Mathematics Subject Classification: Primary 33D15, 33D90, 11A55, Secondary 11F20, 33F05.

1. Introduction, Notations and Definitions

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

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

$$(a;q)_0 = 1$$

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

and

$$(a_1, a_2, ..., a_r; q)_n = (a_1;q)_n(a_2;q)_n...(a_r;q)_n.$$

With theses notations, a basic hypergeometric series (q-series) is defined by,

$${}_r\Phi_s\left[\begin{array}{l} a_1, a_2, ..., a_r; q; z \\ b_1, b_2, ..., b_s \end{array}\right] = \sum_{n=0}^{\infty}\frac{(a_1, a_2, ..., a_r; q)_n z^n}{(q, b_1, b_2, ..., b_s; q)_n}\left\{(-1)^n q^{n(n-1)/2}\right\}.$$