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CERTAIN NEW MODULAR EQUATIONS OF MIXED DEGREE IN THE THEORY OF SIGNATURE 3

Khaled A. A. Alloush, K. R. Rajanna* and M. Manjunath**

Department of Mathematics
King Saud University, Riyadh-12373, SAUDI ARABIA
E-mail:- khaledindia@gmail.com

*Department of Mathematics
Acharya Institute of Technology,
Soldevanahalli, Chikkabanavara (Post),
Hesaragatta Main Road, Bangalore-560090, INDIA.
E-mail: rajanna@acharya.ac.in

**Department of Mathematics,
P E S College of Science, Mandya, INDIA.
E-mail: mmanjunathapes@gmail.com

Abstract: In this paper, we establish certain new modular equations of mixed degree in the theory of signature 3, which are analogous to the Ramanujan-Russell type modular equation and the Ramanujan-Schläfli type mixed modular equations.

Keywords and Phrases: Theta-function, modular equations.

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1. Introduction

As usual for any complex number a, we define

$$(a)_0 := 1$$

and

$$(a)_n := a(a+1)(a+2)(a+3)...(a+n-1)$$

for any positive integer n. The Gauss hypergeometric series is defined by

$${}_2F_1\left[\begin{array}{c} a,b \\ c \end{array};x\right] := \sum_{k=0}^{\infty} \frac{(a)_k(b)_k}{(c)_k k!}x^n, \quad |x|<1.$$