

**SUMMATION FORMULAS FOR FOURTH KIND APPELL'S  
FUNCTION HAVING DIFFERENT ARGUMENTS**

**M. I. Qureshi, M. S. Baboo\* and Ashfaq Ahmad**

Department of Applied Sciences and Humanities,  
Faculty of Engineering and Technology,  
Jamia Millia Islamia (A Central University), New Delhi - 110025, INDIA

E-mail : miqureshi\_delhi@yahoo.co.in, ashfaqmaths@gmail.com

\*School of Basic Sciences and Research,  
Sharda University, Greater Noida, Uttar Pradesh - 201306, INDIA

E-mail : mesub007@gmail.com

(Received: Aug. 28, 2020 Accepted: Aug. 11, 2021 Published: Aug. 30, 2021)

**Abstract:** The objective of this paper is to find the closed form of the summation theorems for Appell's hypergeometric function  $F_4$  having the arguments  $\frac{-1}{32}, \frac{1}{16}, \frac{\pm i}{6}$ , with suitable convergence conditions.

**Keywords and Phrases:** Gauss hypergeometric function; Appell's double hypergeometric function of Fourth kind.

**2020 Mathematics Subject Classification:** Primary 33C65, 33C20; Secondary 33C05.

### 1. Introduction and Preliminaries

In the usual notation, let  $\mathbb{R}$  and  $\mathbb{C}$  denote the sets of real and complex numbers, respectively. Also let

$$\mathbb{N}_0 := \mathbb{N} \cup \{0\} \quad , \quad \mathbb{N} := \{1, 2, 3, \dots\} = \mathbb{N}_0 \setminus \{0\} \quad ,$$

$$\mathbb{Z}_0^- := \{0, -1, -2, \dots\} = \mathbb{Z}^- \cup \{0\} \quad , \quad \mathbb{Z}^- := \{-1, -2, -3, \dots\}$$

and  $\mathbb{Z} = \mathbb{Z}_0^- \cup \mathbb{N}$  being the sets of integers.