South East Asian J. of Math. & Math. Sci. **ISSN : 0972-7752**
Vol.14, No.1 2018, pp. 47-58

STUDY OF GENERALIZED EXTENDED MITTAG-LEFFLER FUNCTION AND IT'S PROPERTIES

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(Received: December 06, 2017)

Abstract: In this paper, we study various properties of *generalized extended Mittag-Leffler function*. Further, we derive some of it's integral transforms which include Mellin transform, Euler Beta transform and Laplace transform. This paper generalizes the results derived by Özarslan and Yilmaz [5] and Shukla and Prajapati [11].

Keywords and Phrases: Mittag-Leffler function, Generalized Beta function, Laplace Transform, Mellin Transform.

2010 Mathematics Subject Classification: 33E12, 33B15, 44A10.

1. Introduction

The importance of Mittag-Leffler function and its generalizations were understood when it was observed that Mittag-Leffler function naturally arises in the solution of integral and fractional order differential equations as well as solution of general problem of the theory of analytic functions. Mittag-Leffler type functions have considerably developed in last two decades showing vast potential of applications in stochastic systems theory, dynamical system theory, statistical distribution theory, disordered and chaotic systems, etc. These functions are amenable to fractional calculus techniques studied by Srivastava *et al.* [12, 16], Gorenflo *et al.* [1], Samko *et al.* [9], Saxena-Saigo [10], Kiryakova [2], Kumar and Saxena [3], etc.
The one-parametric Mittag-Leffler function of the form $E_\delta(z)$ was introduced by Gosta Mittag-Leffler [4] in 1903 and was defined by the power series of $z \in \mathbb{C}$ as follows

$$E_\delta(z) = \sum_{n=0}^{\infty} \frac{z^n}{\Gamma(\delta n + 1)} \qquad (\delta \in \mathbb{C},\ \mathrm{Re}(\delta) > 0), \tag{1}$$