FRACTIONAL CALCULUS OPERATORS OF THE GENERALIZED EXTENDED MITTAG-LEFFLER FUNCTION AND RELATED JACOBI TRANSFORMS

Shilpa Kumawat, Hemlata Saxena and Purnima Chopra*

Department of Mathematics,
Career Point University,
Kota - 325003, Rajasthan, INDIA

E-mail : shilpaprajapat786@gmail.com, saxenadrhemlata@gmail.com

*Formerly Department of Mathematics,
Marudhar Engineering College,
Bikaner - 334001, Rajasthan, INDIA

E-mail : purnimachopra05@gmail.com

Abstract: Our aim is to obtain certain image formulas of the p–extended Mittag-Leffler function $\mathcal{E}_{\alpha,\beta,p}^{\gamma}(z)$ by using Saigo's hypergeometric fractional integral and differential operators. Corresponding assertions for the classical Riemann-Liouville (R-L) and Erdélyi-Kober (E-K) fractional integral and differential operators are established. All the results are represented in terms of the Hadamard product of the p–extended Mittag-Leffler function $\mathcal{E}_{\lambda,\mu,p}^{\gamma}(z)$ and Fox-Wright function $_r\Psi_s(z)$. We also established Jacobi and its particular assertions for the Gegenbauer and Legendre transforms of the p–extended Mittag-Leffler function $\mathcal{E}_{\alpha,\beta,p}^{\gamma}(z)$.

Keywords and Phrases: Fractional Calculus operators, Fox-Wright function, Generalized hypergeometric function, Extended Mittag-Leffler function, Gegenbauer and Legendre transforms.

2020 Mathematics Subject Classification: Primary 26A33, 33B20, 33C20; Secondary 26A09, 33B15, 33C05.