APPENDIX A

LIST OF PUBLICATIONS

Papers in Refereed Journals


• B.K. Dutta and L.K. Arora, “Fractional Elzaki’s Transform”, (Communicated for publication).

• B.K. Dutta, L.K. Arora and N. Saikia, “Generalized Taylor’s like formula for Caputo-type fractional derivative”, (Communicated for publication).

Presentations in Conferences

APPENDIX B

LIST OF SYMBOLS

Sets

\( \mathbb{N} \) natural numbers, \( \mathbb{N} := \{1, 2, 3, \cdots \} \)
\( \mathbb{N}_0 \) counting numbers, \( \mathbb{N}_0 := \{0, 1, 2, \cdots \} \)
\( \mathbb{Z} \) integer numbers, \( \mathbb{Z} = \{ \cdots -2, -1, 0, 1, 2, \cdots \} \)
\( \mathbb{R} \) real numbers
\( \mathbb{C} \) complex numbers, \( \mathbb{C}_0 := \{x + iy : x, y \in \mathbb{R}, i = \sqrt{-1}\} \)
\( \mathcal{C}, \mathcal{C}[a, b] \) set of continuous function
\( \mathcal{C}^n, \mathcal{C}^n[a, b] \) set of function with continuous \( n^{th} \) derivative
\( \mathcal{L}_p, \mathcal{L}_p[a, b] \) Lebesgue space
\( \bar{U} \) closure of the set \( U \)
\( \partial U \) boundary of \( U \)

Functions

\( o, O \) Landau symbols
\( \binom{n}{i} \) Binomial coefficient
\( [\cdot] \) Ceiling function; \( [x] = \min\{z \in \mathbb{Z} : z \leq x\} \)
\( \Gamma(z) \) Euler’s continuous gamma function
\( E_\alpha(z) \) Mittag-Leffler function in one parameter, \( \alpha \)
APPENDIX B. LIST OF SYMBOLS

\[ E_{\alpha,\beta}(z) \] Mittag-Leffler function in two parameters, \( \alpha, \beta \)

\[ _2F_1(a, b; c; z) \] Gauss hypergeometric function

\( H \)-function Fox’s \( H \)-function

\( I \)-function Saxena’s multivariable \( I \)-function

Differential and Integral operators

\[ := \quad \text{means that the left side is defined by the right side} \]

\[ D^n, \frac{d^n}{dt^n} \quad n^{th} \text{ order derivative, } n \in \mathbb{N} \]

\[ J^n \quad n\text{-fold integral, } n \in \mathbb{N} \]

\[ T^\alpha_{a+}, D^-\alpha \quad \text{Left-sided Riemann-Liouville integral operator, } \Re(\alpha) > 0 \]

\[ D^\alpha \quad \text{Left-sided Riemann-Liouville differential operator, } \Re(\alpha) \geq 0 \]

\[ C_D^\alpha \quad \text{Left-sided Caputo’s differential operator, } \Re(\alpha) \geq 0 \]

\[ D_x^\alpha f, f^{(\alpha)} \quad \text{Left-sided Modified Riemann-Liouville derivative, } \alpha \in \mathbb{R}_+ \]

\[ E_{\alpha,\beta} \quad \text{Left-sided Erdelyi-Kober integral operator, } \alpha(> 0), \beta \in \mathbb{R} \]

\[ T^\alpha_{a+}, T^\alpha_{a+} \quad \text{Left-sided Saigo’s integral operator, } \alpha(> 0), \beta, \gamma \in \mathbb{R} \]

\[ D^\alpha_{a+}, D^\alpha_{a+} \quad \text{Left-sided RL type Saigo’s differential operator, } \alpha(\geq 0), \beta, \gamma \in \mathbb{R} \]

\[ C_D^\alpha_{a+}, C_D^\alpha_{a+} \quad \text{Left-sided Caputo-type differential operator, } \alpha(\geq 0), \beta, \gamma \in \mathbb{R} \]

\[ \ast D^\alpha_{a+}, \ast D^\alpha_{a+} \quad \text{Left-sided modified Caputo-type differential operator, } \alpha(\geq 0), \beta, \gamma \in \mathbb{R} \]

Integral Transforms

\[ \mathfrak{M} f \quad \text{Mellin transform of the function } f \]

\[ \mathcal{L} f \quad \text{Laplace’s transform of the function } f \]

\[ \mathfrak{S} f \quad \text{Sumudu transform of function } f \]

\[ \mathfrak{E} f \quad \text{Elzaki’s transform of function } f \]

\[ \mathcal{L}_\alpha f \quad \text{Fractional Laplace’s transform of function } f \]

\[ \mathfrak{S}_\alpha f \quad \text{Fractional Sumudu transform of function } f \]

\[ \mathfrak{E}_\alpha f \quad \text{Fractional Elzaki’s transform of function } f \]
# APPENDIX C

## ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>FC</td>
<td>Fractional Calculus</td>
</tr>
<tr>
<td>FDE</td>
<td>Fractional Differential Equation</td>
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<tr>
<td>FIVP</td>
<td>Fractional Initial Value Problem</td>
</tr>
<tr>
<td>BIVP</td>
<td>Fractional Boundary Value Problem</td>
</tr>
<tr>
<td>CTMSO</td>
<td>Caputo type modification of the Saigo’s operator</td>
</tr>
<tr>
<td>DTM</td>
<td>Differential Transform Method</td>
</tr>
<tr>
<td>CTDTM</td>
<td>Caputo Type Differential Transform Method</td>
</tr>
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