



A Fibonomial Version of Truncated-Exponential-Based Appell-Type Changhee Polynomials

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Abstract

In this study, a new family of polynomials, called the Truncated-Exponential-Based Appell-Type Changhee F-Polynomials, is introduced by combining the truncated-exponential-based Appell-type Changhee polynomial structure with Fibonomial calculus. The proposed polynomial sequence extends the corresponding classical family to the Fibonacci setting and preserves its essential algebraic characteristics. Several fundamental properties of these polynomials are established, including explicit representations, recurrence formulas, and operational identities. A determinantal representation is also obtained, providing an alternative characterization of the introduced sequence. Furthermore, the associated polynomial matrix is constructed, and its connection with the generalized Fibo-Pascal matrix is investigated. Finally, the generating function is further generalized by incorporating suitable auxiliary functions, yielding bilinear and bilateral generating-function identities together with a variety of special cases that recover several known results.

Keywords: Truncated-exponential polynomials, Changhee polynomials, Appell-type Changhee polynomials, generating function.

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