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DISCRETE LAPLACE TRANSFORMS OF SINE FUNCTION BY NABLA OPERATOR

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Abstract: In this paper, we define difference operator providing some results also we derived Laplace transform of sine series.A definition for the Laplace transform corresponding to the nabla difference operator is given.

Keywords and Phrases: Generalized Laplace Transform, Inverse Difference Operator, Nabla Operator and Sine Series.

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1. Introduction

Many applications are obtained using difference equation and its corresponding difference operator ∇. The Laplace transform can also be used to solve differential equation and is used extensively in electrical engineering.The theory of difference equation is developed the difference operator $\nabla_\ell u(k) = u(k) - u(k-l), k \in N$, where N is the set of natural numbers. The Laplace Transform of $f(t)$ is defined by $L(f(t)) = \int_0^\infty e^{-st} f(t)dt$ provided the integral exists, s is a parameter.

Definition 1.1. *If n and ℓ are any two positive integers then the generalized positive polynomial factorial is $k_\ell^{(n)} = k(k-\ell)(k-2\ell)...(k-(n-1)\ell), k_\ell^{(0)} = 1$ and*