

ULTRA GAMMA FUNCTION, PROPERTIES AND APPLICATIONS: A PRODIGY

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Dedicated to Prof. M.A. Pathan on his 75th birth anniversary

Abstract: In the present paper we consider a unified integral transform “*Ultra Gamma Transform*” (UGT) and its relation with fractional integral operators. We list out certain properties of this transform and present a table of UGT of elementary functions including trigonometric function as well as hyperbolic function in terms of generalized three parameter gamma function renamed as “*Ultra Gamma Function*” (UGF). We also point out certain special cases of this integral transform in terms of well-known classical integral transforms, other integral transforms and generalized gamma function that occurs in the study of scattering of waves and that with the classical gamma function in support of justification of the findings. Finally some statistical affiliations of UGF are reported from real life applications point of view.

Keywords: Gamma Functions, Integral Transform, Fractional Integral Operators, Probability Distribution.

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1. Introduction

The classical gamma function is the key function in the development of special functions of importance in various Scientific and Engineering problems (See Erdélyi [7]). Kobayashi [13] formally defined the generalization of classical gamma function, which appears in the Weiner-Hopf technique (See Noble [18]) of dealing with the problem of wave scattering. Kobayashi’s generalized function involves two parameters and readily yields the classical gamma function as a special case.