



ON A NEW CLASS OF REFINED DISCRETE HARDY-TYPE INEQUALITIES

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Dedicated to Professor Lars-Erik Persson for his 65th birthday

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ABSTRACT. In this paper, we state, prove and discuss a new refined general weighted discrete Hardy-type inequality with a non-negative kernel, related to an arbitrary non-negative convex (or positive concave) function on a real interval and to a positive real parameter. As its consequences, obtained by rewriting it for various suitably chosen parameters, kernels, weights and convex (or concave) functions, we derive new weighted and unweighted generalizations and refinements of some well-known inequalities such as Carleman's inequality and the so-called Godunova's inequality. Finally, by employing exponential and logarithmic convexity, as special cases of the usual convexity, we obtain some further refinements of the inequalities mentioned above.

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