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GENERALIZED FRACTIONAL DIFFERENTIAL EQUATIONS BY USING A FIXED POINT THEOREM FOR GENERALIZED CONTRACTIVE TYPE

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Abstract. In this research paper, we apply a new fixed point theorem for generalized (α, g, q)-contractive mappings and through it, we prove the existence of solution for nonlinear generalized fractional differential equations with integral boundary condition involving Caputo fractional derivative with respect to another function ψ. An example is given to illustrate the results.

Keywords. fractional differential equation; boundary conditions; fixed point theorem; generalized contractive type.

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1 Introduction and preliminaries

In the past decades, two subjects have been violently studied: fractional differential equations (FDEs) and fixed point theory. comparatively, fractional calculus (FC) and FDEs are very fresh subjects for the investigators, and, recently, many important results have been recorded [18, 19, 1, 8, 12, 9]. Lately, many authors introduced some new fractional operators which dealt with the existence and uniqueness results of different types of FDEs by using various types of fixed point theorems, we refer the reader with references [2, 3, 6, 5, 20, 13, 14, 30, 16, 22, 25, 32, 33]. For instance, Vivek et al., in