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NEW OSCILLATION CRITERIA FOR A CLASS OF SECOND ORDER NEUTRAL DELAY DYNAMIC EQUATIONS

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Abstract. This work is concerned with the study of a class of neutral delay dynamic equations of the form

$$\text{(E)} \qquad \left(r(t)\left((y(t)+p(t)y(\delta(t)))^{\Delta}\right)^{\alpha}\right)^{\Delta}+q(t)y^{\beta}(\tau(t))=0$$

on a time scale T. Sufficient conditions for oscillation of (E) are obtained under the various ranges of $p(t)$ with $\alpha,\ \ \beta>0$ are the ratio of odd positive integers. It has been shown that the oscillatory solutions of (E) classified as C_{-1}, C_0 and C_1 type.

Keywords. Oscillation, neutral, delay dynamic equations, time scales.

AMS (MOS) subject classification: 34K11, 34C10, 39A13.

1 Introduction

It is S. Hilger [12] who has introduced the *Theory of time scales* in his Ph.D thesis(1988). For the last decade, it is gaining interest and its beauty lies behind the unification of continuous and discrete analysis and some cases in between. Many researchers have contributed on different aspects of this new theory; see the survey paper by Agarwal [1] and the references cited there in. More about the time scales, time scale calculus and its organization we refer the books [5] and [6].

A time scale T is an arbitrary closed subset of the reals, and the cases when this time scale is equal to the reals or to the integers represent the classical theories of so called differential or difference equations. Interestingly, there is a time scale followed by *quantum calculus* which has been applied to *Quantum Mechanics*. Many other time scales exist and they give rise to plenty of applications (see for e.g. [5]).