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OSCILLATORY AND ASYMPTOTIC BEHAVIOUR OF FOURTH ORDER NON-LINEAR NEUTRAL DELAY DYNAMIC EQUATIONS

S. Panigrahi and P. Rami Reddy

Department of Mathematics and Statistics
University of Hyderabad
Hyderabad - 500 046, India

Corresponding author email:spsm@uohyd.ernet.in

Abstract. In this paper, oscillatory and asymptotic property of solutions of a class of nonlinear fourth order neutral dynamic equations of the form

$$(H) \quad (r(t)(y(t) + p(t)y(\alpha(t)) \ )^{\Delta^2})^{\Delta^2} + q(t)G(y(\beta(t))) = 0$$

and

$$(NH) \quad (r(t)(y(t) + p(t)y(\alpha(t)) \ )^{\Delta^2})^{\Delta^2} + q(t)G(y(\beta(t))) = f(t) \quad for \quad t \in [t_0, \infty]_\mathbb{T},$$

where $\mathbb{T}$ is a time scale such that $\sup \mathbb{T} = \infty$, $t_0(\geqslant 0) \in \mathbb{T}$ are studied under the assumption $\int_{t_0}^{\infty} \frac{\sigma(t)}{r(t)} \Delta t < \infty$ for various ranges of $p(t)$. Sufficient conditions are obtained for the existence of bounded positive solutions of (NH) by using Schauder's fixed point theorem.

Key words. Oscillation, nonoscillation, neutral dynamic equations, asymptotic behaviour, timescale.

AMS (MOS) subject classification: 34C10, 34C15, 34N05.

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