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ON UNBOUNDED SOLUTIONS OF A CLASS OF DIFFERENTIAL EQUATIONS WITH DEVIATING ARGUMENT

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Dedicated to the memory of Karol Borsuk

1. Introduction

In this paper we consider the oscillatory and nonoscilatory behavior of solutions of the functional differential equation

$$(\mathrm{E}_1) \qquad x'' + q(t)F(x(g(t)), x'(h(t))) = 0 \qquad \left(' = \frac{d}{dt} \right)$$

Throughout by a solution of (E_1) we shall mean a twice continuously differentiable function which exists on some half-line $[t_x, +\infty)$, satisfies (E_1) and does not eventually vanish.

As usual a solution of (E_1) is said to be oscillatory or nonoscillatory according to whether it does or does not have arbitrarily large zeros. A nonoscillatory solution x of (E_1) is said to be weakly oscillatory if x' changes sign for arbitrarily large values of t (see for example, [14], [15]).

In the study of the qualitative behavior of solutions of functional differential equations, it is often assumed that the solutions under consideration are continuable to the right for large t and the oscillatory character of those solutions is obtained by means of integral inequalities and/or integral averaging techniques. It is clear