G. Kvinikadze

A. Razmadze Mathematical Institute, Georgian Academy of Sciences
Tbilisi, Georgia

LINEAR FUNCTIONAL DIFFERENTIAL EQUATIONS WITH PROPERTY A

The differential equation

$$u^{(n)}(t) + \sum_{i=1}^{m} \int_{\tau_i(t)}^{\sigma_i(t)} u(s)\, d_s r_i(s,t) = 0 \tag{1}$$

is considered, where $n \geq 2$, $\sigma_i, \tau_i \in C(R_+; (0,\infty))$, $\tau_i(t) \leq \sigma_i(t)$, while the functions $r_i : R_+ \times R_+ \to R$ are nondecreasing in the first argument and Lebesgue integrable in the second argument on any finite subsegment of $[0, +\infty)$.

We say that equation (1) has Property A if any of its solutions is oscillatory when n is even and either is oscillatory or satisfies

$$|u^{(i)}(t)| \downarrow 0 \quad \text{for} \quad t \uparrow +\infty \quad (i = 0, \ldots, n-1)$$

when n is odd. Sufficient conditions are established for equation (1) to have Property A. The obtained results are new even for a special case of equation (1) – the differential equation with deviated arguments.