BOUNDARY VALUE PROBLEM WITH MULTIPOINT CONDITIONS FOR A THIRD ORDER DIFFERENTIAL EQUATION [1]

SERGEY SMIRNOV

Institute of Mathematics and Computer Science, University of Latvia

Raiņa bulvāris 29, Rīga LV-1459, Latvia

E-mail: `srgsm@inbox.lv`

We investigate the existence and multiplicity of solutions to the boundary value problem consisting of the nonlinear third order differential equation

$$x''' + f(t, x) = 0 \tag{1}$$

subject to the m-point boundary conditions

$$x(0) = x'(0) = 0, \ x(1) = \sum_{i=1}^{m-2} x(\xi_i), \tag{2}$$

where $0 < \xi_1 < \xi_2 < \cdots < \xi_{m-2} < 1$ are fixed numbers.

Our approach is based on the oscillatory behavior of solutions of equation (1). The combination of the shooting method and scaling method is used in the proof of our main result.

Examples and figures are included to illustrate the results.

REFERENCES

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