

FINITE DIFFERENCE METHODS FOR THE SOLUTION OF A CLASS OF SINGULAR PERTURBATION PROBLEMS

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Abstract

In this paper, we have used the Fourth order finite difference schemes to find the numerical solution of the singular perturbation problem (SPP)

$$\epsilon y'' + a(x)y'(x) + b(x)y(x) = r(x), \quad 0 \leq x \leq 1; \quad y(0) = \alpha, \quad y(1) = \beta. \quad (1)$$

Linear and non-linear singular perturbation problems have been solved and the numerical results are presented to support the theory. It is observed that the present method approximates the exact solution very well.

Key Words : *Singular Perturbation Problems, Two-Point Boundary Value Problems, Tridiagonal System, Ordinary Differential Equations.*

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