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GALERKIN METHOD FOR COUPLED SYSTEM OF BOUNDARY VALUE PROBLEMS

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Abstract

A finite element method involving Galerkin method with cubic B-splines as basis functions has been developed for a coupled system of boundary value problems. The basis functions have been redefined into a new set of basis functions which vanish on the boundary where the Dirichlet type boundary conditions are prescribed. The solution for coupled system of nonlinear boundary value problems have been obtained as the limit of sequence of solutions for coupled linear problems generated by the quasilinearization technique. The method is tested on three coupled system of linear boundary value problems and one coupled system of nonlinear boundary value problem. Numerical results obtained by the present method are giving better results when compared with the results available in the literature.

Key Words: Galerkin method, B-spline, Coupled system, Basis function, Maximum absolute error.