Numerical Solution of Coupled system of Boundary value problems by Galerkin method with different order B-splines.

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In the current paper, we present a Galerkin method with cubic, quarticB-splines for the numerical solution of highly coupled system of nonlinear boundary value problems (BVP).The method is actually applied on a linearized form of given BVP. For this we used quasi linearization technique to convert the given nonlinear BVP into a sequence of linear BVPs. For each linear BVP, each unknown variable is approximate by a linear combination of cubic B-splines or quartic B-splines depending on the order of variable that is present in the given BVP. For a variable with third order derivative present in given BVP, we used quartic B-splines where as for the variables with second order derivative, we used cubic B-splines in the approximation. Galerkin method was employed with these approximations and hence obtained the results. The convergence criterion for the solution of sequence of linear BVP is fixed at . To test the efficiency of the proposed method, we employed the presented method on a problem which is available in the literature. Numerical results obtained by the proposed method are in with good agreement with the results available in the literature for the tested problem.

***Keywords*:** Coupled nonlinear boundary value problem, Galerkin method, B-spline, Numerical solution