1116-65-321 **Md. Shafiqul Islam*** (mdshafiqul@du.ac.bd), Department of Applied Mathematics, AF Mujibur Rahman Ganit Bhavan, Ramna, Dhaka, 1000, Bangladesh. *Numerical solutions of higher order eigenvalue problems.*

The aim of this research article is to compute the eigenvalues of high order linear Sturm-Liouville problems (SLP) numerically by the well known Galerkin weighted residual method. In the approximated Galerkin method Bernstein polynomials are used as the trial functions. Imposing boundary conditions to the higher order eigenproblems is quite complicated which comprise of derivatives of order more than one. Since higher order problems without reducing the order of the equations and all kind of derivative boundary conditions are imposed directly in the weak form of the integrand, so a rigorous matrix formulation for eighth order SLP is developed. This formulation can be applied for any high even order (e.g., fourth, sixth, tenth, etc.) SLP. Details, the efficiency and the implementation of the proposed method, are thus described by considering fourth, sixth, eighth and tenth order linear SLP as numerical examples. The numerical results, investigated in this proposed method, are compared with those obtained, by other numerical and analytical techniques, available in the literature. Finally, the computational eigenvalues are found with a great accuracy. (Received August 25, 2015)