1145-45-1742 **Samiran Chakraborty*** (samiranchakraborty@iitkgp.ac.in), Department of Mathematics, IIT Kharagpur, Kharagpur, 721302, India, and **Gnaneshwar Nelakanti** (gnanesh@maths.iitkgp.ac.in), Department of Mathematics, IIT Kharagpur, India. *Convergence Results of Newton Iteration Method for nonlinear Fredholm Hammerstein Integral Equations.*

In this paper we consider Newton-iteration scheme based on Galerkin, iterated Galerkin and multi-Galerkin operator for solving non-linear integral equations of Fredholm-Hammerstein type for both smooth and weakly singular kernels. If $\mathbb{X}_n$ is a space of piecewise polynomial subspace of degree $\leq m-1$, we show that for a smooth kernel, Galerkin, iterated Galerkin and multi-Galerkin solution in the k-th Newton-iteration scheme converges with the orders $\mathcal{O}(h^{(k+1)m})$, $\mathcal{O}(h^{(k+2)m})$ and $\mathcal{O}(h^{2(k+1)m})$, respectively, where h is the norm of the partition. For weakly singular kernels, we show that the Galerkin solution in the k-th Newton-iteration scheme converges with the order $\mathcal{O}(h^{(k+1)(1-\alpha)})$, $0<\alpha<1$ for algebraic kernal and $\mathcal{O}(h^{k+1}(\log h)^{k+1})$ for logarithmic kernel. Also the iterated Galerkin and multi-Galerkin solution in the k-th Newton-iteration scheme converges with the order $\mathcal{O}(h^{m+(k+1)(1-\alpha)})$ for algebraic kernel and with the order $\mathcal{O}(h^{m+k+1}(\log h)^{k+1})$ for logarithmic kernel. Similar results are also proved for collocation, iterated collocation and multi-collocation operators. (Received September 24, 2018)