THE EQUIVALENCE OF CONVERGENCE THEOREMS OF
ISHIKAWA–MANN ITERATIONS WITH ERRORS FOR \(\Phi\)-CONTRACTIVE
MAPPINGS IN UNIFORMLY SMOOTH BANACH SPACES

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Abstract. Let \(E\) be an arbitrary uniformly smooth real Banach space, \(D\) be a nonempty closed convex subset of \(E\), and \(T : D \to D\) a generalized Lipschitz \(\Phi\)-contractive mapping with \(q \in F(T) \neq \emptyset\). Let \(\{a_n\}, \{b_n\}, \{c_n\}, \{d_n\}\) be four real sequences in \([0, 1]\) and satisfy the conditions:

(i) \(a_n + c_n \leq 1, b_n + d_n \leq 1\); (ii) \(a_n, b_n, d_n \to 0\) as \(n \to \infty\); (iii) \(c_n = o(a_n)\); (iv) \(\sum_{n=0}^{\infty} d_n = \infty\). For some \(x_0, z_0 \in D\), let \(\{u_n\}, \{v_n\}, \{w_n\}\) be any bounded sequences in \(D\), and \(\{x_n\}\) and \(\{z_n\}\) be Ishikawa and Mann iterative sequences with errors defined by (1.1) and (1.2), respectively. Then the convergence of (1.1) is equivalent to that of (1.2).


Keywords and phrases: Generalized Lipschitz mapping, \(\Phi\)-contractive mapping, Ishikawa-Mann iterative sequences with errors, uniformly smooth real Banach space.

REFERENCES


