1176-46-146 **Vira Babenko*** (vira.babenko@drake.edu), **Vladyslav Babenko** and **Oleg Kovalenko**.

Approximation of operators in semi-linear metric spaces and some applications.

Let (Y, h_Y) be semi-linear metric space (L-space), $S\colon D_S \to Y$, and $A\colon D_A \to Y$ be operators. Let also $Q \subset D_S \cap D_A$. The problem to find the quantity

$$U(A, S; Q) = \sup\{h_Y(Ax, Sx)\colon x \in Q\}$$

plays a vital role in Approximation Theory and Numerical Analysis.

We prove a generalized Korneichuk–Stechkin lemma which gives an estimation of this quantity for some operators on the classes of L-space-valued functions defined by the given modulus of continuity. As applications, we solve various problems of optimal recovery of operators on such classes of functions. The recovery is done based on n values of the function or on function's n mean values over intervals. We also obtain sharp Landau type inequalities and solve an analog of the Stechkin problem about approximation of unbounded operators by bounded ones and the problem of optimal recovery of an unbounded operator on a class of elements, known with error. The utilization of L-space-valued functions gives a unified approach to the solution of the mentioned above problems for the classes of multi- and fuzzy-valued functions, and for the classes of functions with values in Banach spaces, particularly random processes and many other classes of functions. (Received January 19, 2022)