ABSTRACT

This thesis deals with a number of aspects of mathematical programming problems, and variational problems involving generalized $\rho - (\eta,\ \theta)$-B-invexity in Banach spaces. Specifically, we find the optimality conditions, and different types of duality results under $\rho - (\eta,\ \theta)$-invexity, generalized $\rho - (\eta,\ \theta)$-invexity, $\rho - (\eta,\ \theta)$-B-invexity, generalized $\rho - (\eta,\ \theta)$-B-invexity in a real Banach space X. Optimality conditions, and duality results for multiobjective variational problems with generalized $\rho - (\eta,\ \theta)$-B-type-I are considered. The relationship between $(\rho,\ \theta)$-B-vexity, $(\rho,\ \theta)$-B-vex sets, $\rho - (\eta,\ \theta)$-B-preinvexity, generalized $\rho - (\eta,\ \theta)$-invexity, and generalized $\rho - (\eta,\ \theta)$-invarant-monotonicity are studied in the thesis.

The thesis also characterizes the formulation of continuous-time programming problems, which are applied to a class of variational type inequality problems (VIP). A number of examples and counterexamples are also presented in the thesis.

Keywords: $\rho - (\eta,\ \theta)$-invexity, generalized $\rho - (\eta,\ \theta)$-invexity, $\rho - (\eta,\ \theta)$-B-invexity, generalized $\rho - (\eta,\ \theta)$-B-invexity, $\rho - (\eta,\ \theta)$-B-type-I, generalized $\rho - (\eta,\ \theta)$-B-type-I, Wolf, Mond-Weir type duals, and Mixed type dual, multiobjective programming problems, variational problems, continuous-time programming problem, variational-type inequality.