

Optimality and Duality for Semi-infinite (h, φ) – E – convex Programming Problem

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ABSTRACT

In this paper, a semi-infinite single objective programming problem under (h, φ) – E – convexity is considered. A new class of function called (h, φ) – E – convex function and its generalizations namely pseudo – (h, φ) – E – convex function and quasi – (h, φ) – E – convex function is introduced. We consider the following nonsmooth semi-infinite (h, φ) – E – convex programming primal problem:

$$(P) \quad \min f(x)$$

subject to

$$g_j(x) \leq 0; j \in J$$

$$x \in R^n$$

where J is an index set possibly infinite, $f(x)$, and $g_j(x)$, $j \in J$ are locally Lipschitz (h, φ) – E – convex functions from R^n to $R \cup \{+\infty\}$. Duality theorems, weak duality theorem and strong duality theorem are established for the so formed dual (Wolfe type dual and Mond-Weir type dual) of the semi-infinite (h, φ) – E – convex programming problem in the setting of Ben-Tal's generalized algebraic operations under various generalized (h, φ) – E – convexity assumptions. Also, the necessary and sufficient optimality conditions for the established primal problem are obtained.

Keywords: E – convex function; (h, φ) – E – convex function; duality; optimality.

