

ABSTRACT

This paper which is presented in three chapters, provides a review of what has been done in duality theory in mathematical programming along with some simple extensions. Moreover a unified approach to duality in fractional functionals programming is presented.

Chapters One and Two mainly presents a review of what is done in duality in linear and convex programming. In Chapter Two, Section Three, duality theorems of Chadha [13] are established under weaker assumptions. In Chapter Three, Section One a dual for a class of quadratic fractional functionals programmes, looked at by Swarup in [37], is formulated. For this dual, which differs from the one presented by Schaible in [56], the author was able to establish a Converse Duality Theorem, which generalizes the result of Dorn [20].

Duality theorems for a class of non-differentiable concave-convex fractional functionals programmes are established, by extending duality results of Mond [53] for a class of non-differentiable convex programmes, in Chapter Three, Section Two, Part One. In Part Two a duality theory for generalized linear fractional programmes, which parallels the usual results for linear fractional programmes, is presented. The duals are a

form of inexact linear programmes and can be solved by the simplex method.

Finally, a recent result of Schaible and Jagannathan in [57] on duality in multiobjective non-linear fractional programmes is shown to hold under a weaker set of assumptions.