INTRODUCTION

In this thesis, we study some important partially ordered semirings.

In [1], L. Fuchs has given some theorems of partially ordered semigroups, partially ordered groups, partially ordered rings and partially ordered fields. By the definitions, rings and fields are special examples of distributive seminear-rings. The first propose of this thesis is to study other special examples of partially ordered distributive seminear-rings, namely, partially ordered distributive ratio seminear-rings, partially ordered distributive near-rings and partially ordered distributive seminear-fields.

It is a well known and important theorem in mathematics that any two complete ordered fields are isomorphic (see [2]). In [3], P. Wisetmongkolchai has classified all complete ordered skew rings, complete ordered skew ratio semirings and complete ordered 0-skew semifields. He also partially classified complete ordered ∞-skew semifields. By the definitions, a distributive ratio seminear-ring and a distributive seminear-field are generalizations of a skew ratio semiring and a skew semifield, respectively. The second propose of this thesis is to study the problem of classifying complete ordered distributive ratio seminear-rings and complete ordered distributive seminear-fields.

In Chapter I, we introduce some notations and examples and give definitions and theorems concerning distributive seminear-rings that will be used in later chapters.

In chapter II, we shall give some fundamental theorems of a theory of partially ordered distributive ratio seminear-rings, give a characterization determining when a distributive seminear-ring can be extended to a partially ordered distributive ratio seminear-ring and classified all complete ordered distributive ratio seminear-rings.

In Chapter III, we shall give some fundamental theorems of a theory of partially ordered distributive near-rings and give a characterization determining when a distributive seminear-ring can be extended to a partially ordered distributive near-ring.

In Chapter IV, we are able to classify all complete ordered distributive seminear-fields of zero type and partially classify complete ordered distributive seminear-fields of infinity type.