Proposition 21. In a Bezout GKD a prime ideal is either principal or idempotent.

Finally to study the primary decomposition in Prüfer domains we proceed as follows.

Let R be an integral domain, an ideal P is said to be an S-ideal in R if (1) P is prime (2) the set of P-primary ideals is linearly ordered (3) the intersection of all the P-primary ideals is a prime ideal M (4) M contains each prime ideal properly contained in P. An integral domain R is said to be an S-domain if every prime ideal of R is an S-ideal (cf [13] pp. 249-250).

According to Cor. 2.5 of [13],($\subsetneq$ ≡ proper containment) " If D is an S-domain and Q_1 ,Q_2 are primary ideals for P_1 ,P_2 respectively, where $P_1 \subsetneq P_2$, then $Q_1 \subseteq Q_2$ "------------(S)

It is easy to establish that a Prüfer domain is an S-domain and that(S) can be proved for a Prüfer domain. But for the convenience of reference we adopt (S) for Prüfer domains and use it to prove

Theorem 22. If a non zero ideal A in a Prüfer domain R has a reduced primary decomposition

$$A = P_1 \cap P_2 \cap \dots \cap P_n \quad \text{-------------------(a)}$$

then (a) is unique.

Proof. Let Rad $P_i = Q_i$ (i = 1,2,...,n), we claim that if (a) is reduced then

(1) Q_i are incomparable under inclusion (i = 1,...,n)

(2) no two P_i ,P_j $i \neq j$ are contained in the same prime ideal Q.

First let $Q_i \subseteq Q_j$ for some $i \neq j$, then if $Q_i = Q_j$; $P_i \subseteq P_j$ or $P_j \subseteq P_i$ because each of the Q_i is an S-ideal and this contradicts the assumption that (a) is reduced. Further if $Q_i \subsetneq Q_j$ then by (S) above $P_i \subseteq P_j$ which again contradicts