Consider a general non zero non unit element y in S, that is $y = r_0 + \sum_{i=1}^{n} a_i x^i$; $r_0 \in R$, $a_i \in K$.

Now y can be of two possible types i.e. such that (1) $r_0 = 0$, (2) $r_0 \neq 0$.

In the first case $y = bx^s(1 + \sum_{j=1}^{n-s} a_j' x^j)$; $a_j', b \in K$. We see that bx^s is a packet, because if

$bx^s = d_1 d_2$; d_i non units and $(d_1, d_2) = 1$, then at least one of d_i say d_1 is of degree zero in x and thus belongs to R, but then $d_1^n | d_2$ for each n and d_2 is of degree $s > 0$ in x; $d_1 | d_2$; a contradiction establishing that (p_1) of Def. 4 holds for bx^s. Further if $bx^s = d_1 d_2$, $s > 0, d_i$ non units either $d_1 \in R$ or $d_1 = b_1 x^{s_1}$. If $d_1 \in R$ obviously $d_1 | d_2$ and if $d_1 = b_1 x^{s_1}, s_1 > 0$ then $d_2 = b_2 x^{s_2}$, where $b_1 b_2 = b$, we note that if $s_2 = 0$ then $d_2 | d_1$ and so we take up $s_2 > 0$ and in this particular case d_1 divides a power of d_2 and vice versa. And to sum up (p_2) of Def. 4 holds for bx^s, that is bx^s is a packet . It is obvious that $(1 + \sum_{j=1}^{n-s} a_j' x^j)$ is a product of atoms . But since, an atom in a Bezout domain is a prime, $(1 + \sum_{j=1}^{n-s} a_j' x^j)$ is a product of powers of primes and can be written as the product of a finite number of mutually coprime powers of primes and thus is a product of a finite number of mutually co-prime packets because a prime power satisfies the requirements of a packet. Moreover since $(bx^s, 1 + \sum_{j=1}^{n-s} a_j' x^j) = 1$, $y = bx^s(1 + \sum_{j=1}^{n-s} a_j' x^j)$ is the product of a finite number of mutually co-prime packets.

In the second case, $y = r_0(1 + \sum_{i=1}^{n} a_i' x^i)$, where $r_0 \in R$