CHAPTER 4

CONCLUSION

Let $V = R^{(\mathbb{N})}$ be a free module over R a local Noetherian ring with M a unique maximal ideal of R, R not an integral domain. Then in this study we found that:

(1) If $Ann_R(M) = \{0\}$, then $fln(V) \leq 1$.

(2) If $Ann_R(M) \neq \{0\}$, then $fln(V) \neq 0$.

(3) If every proper submodule of V contains MV and R/M is infinite, then $fln(V) = \infty$.

(4) If R/M is a field of cardinality q, then $fln(V) \leq q + 2$.

(5) Let $R = \mathbb{Z}_{p^k}$ a local ring with a unique maximal ideal $\langle \bar{p} \rangle$. Then $fln(V) \in \{p+1, p+2\}$. As a special case, we get if $p = 2$, then $fln(V) = 4$.