962-13-971 **Maria A. Avino-Diaz*** (mavino@campus.ccm.itesm.mx), Ave. Universidad 2014, Venezuela F-1203, Copilco, Coyoacan, 04510 Mexico City, Mexico, and **Luis D. Garcia** (galuis@nmsu.edu), Department of Mathematical Sciences, MSC 3MB, P.O. Box 30001, Las Cruces, NM 88003-8001.

A p-Bases Algorithm for Indecomposable $\mathbf{Z}_{p^n}C_p$-Modules.

Let $\mathbf{Z}_{p^n}$ be the ring of integers modulo p^n, $n \geq 2$, and $C_p = \langle x : x^p = 1\rangle$ the cyclic group of order a prime number p. Let $\Lambda = \mathbf{Z}_{p^n}C_p$ be the group algebra over $\mathbf{Z}_{p^n}$. The problem of describing the finite modules of this group algebra has been considered by Szekeres (1949) and Nazarova-Roiter (1969). In both papers a description of the indecomposable modules is given. Aviñó and Bautista calculated the $\mathbf{Z}_{p^n}$-structure of the indecomposable Λ-modules M without taking p-bases of the abelian p-group M. Instead of this modules are well studied, the matrices of $\phi = x-1 \in \Lambda$ and $\pi = x^{p-1}+\cdots+x+1 \in \Lambda$ are not known. In this work we introduce binomial ideals associated to finitely generated abelian groups, the descrition of reduced Gröbner bases of these ideals, and p-basis associated to the reduced Gröbner bases. We present algorithms which obtain a p-basis of the Λ-module M and the matrices of ϕ and π in this p-basis using the invariants of the Λ-module. (Received September 29, 2000)