BIMODULES OVER BIRINGS

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The study of bigroups started in the year 1994 by P.L. Maggu. He had said in his paper that bigroups find its application in industrial problems. Birings have not been defined till 2003. The concept of birings has been defined and analysed in the book on Bialgebraic Structures and Smarandache Bialgebraic Structures (W. B. Vasantha Kandasamy, American Research Press, 2003).

To define a bimodule over a biring we take an abelian bigroup $M$ and $R$ any biring. The biring $M = M_1 \cup M_2$ is defined to be a $R$-module over the biring $R = R_1 \cup R_2$ if $M_1$ is an $R_1$ module and $M_2$ is a $R_2$-module. The $R$-bimodule $M$ is said to be unitial if both $M_1$ and $M_2$ are unitial $R$-modules. Thus to define $R$-bimodule we need both the algebraic structure to be bistructures i.e. $M$ is a bigroup and $R$ is a biring. We define sub-bimodule and a cyclic bimodule in this paper.

We prove the classical theorem as in case of $R$-modules. If $R$ is a principal ideal then every finitely generated $R$ bimodule is isomorphic to a direct sum of cyclic $R$-bimodules.