

TENSOR PRODUCT OF INTUITIONISTIC FUZZY MODULES

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Abstract: In this paper, we introduce the concept of tensor product between intuitionistic fuzzy submodules. We establish a formal framework for the tensor product operation, examining its properties and applications within the context of intuitionistic fuzzy modules. We then establish a relationship between the Hom functor and the tensor product in the category of intuitionistic fuzzy modules. The connection between tensor products and hom-functors in some algebraic structures, such as modules, is made possible via a natural isomorphism known as the Hom-Tensor adjunction and it establishes a relationship between $\mathbf{Hom}_{\mathbf{C}_{R\text{-IFM}}}(B \otimes A, C)$ and $\mathbf{Hom}_{\mathbf{C}_{R\text{-IFM}}}(A, \mathbf{Hom}_{\mathbf{C}_{R\text{-IFM}}}(B, C))$. An application of tensor product of intuitionistic fuzzy modules can be used in decision-making processes by embracing ambiguity and vagueness, making it a valuable tool when exact data is lacking.

Keywords and Phrases: Hom functor, Tensor product, Category, Intuitionistic fuzzy R -homomorphism.

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1. Introduction

The tensor product is a fundamental construction in algebra and module theory. It provides a way to extend the notion of the product of modules, allowing for a