

Dr. K. R. Nemade: Generalized Inner Product Space

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New Horizon

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Index

	From The Bench of Editor		5
1	Critical Analysis of Various Legislations Relating to Protection of Disabled persons in India	Prof. N.R. Thawale	6
2	Research Productivity of Faculty Members in the Department of Applied Mechanics, VNIT, Nagpur: A Bibliometrics Study	Prof. D.S. Patil	10
3	Judicial Reporting in Dr. B.R. Ambedkar Newspaper	Prof. P.S. Jawade	21
4	Computer in Education An Important Step towards Technology	Prof. N.V. Narule	23
5	Generalized Inner Product Space $A = \{a_0G_0 + a_1G_1 + a_2G_2 / a_i \in F \& G_i \in C(P)\}$ Where $C(P)$ = class of algebraic structures of codes in universe	Dr. K. R. Nemade	26
6	The Philosophy of Browning	Dr. V.R. Patki	29
7	Role of College Librarian for Professional Development in Modern Age	Dr. G.P. Urkunde	32
8	Techniques to be applied by family to reduce the educational stress among the students	Prof. Saroj Lakhadive	37
9	Effective Weapon of Agricultural Marketing	Dr. D.M. Chavhan	42
10	Agricultural Products in Maharashtra	Prof. Madhuri Rakhunde	45
11	Plato's concept of Justice and present Scenario	Prof. R.T. Ade	47
12	Comparative of Depth Perception, Agility And Explosive strength of Shoulder in Different Ball Games: A Study	Prof. R.M. Wath	51
13	Causes of injury and safety	Dr. Pavan Mandavkar	57
14	Mother-Tongue To Enhance English Language	Dr. P.B. Ingle	61
15	Domestic Violence in India	Prof. Snehal Khandekar	65
16	Importance of Language and communication	Dr. Veera Mandavkar	68
17	Discipline of Players	Prof. Shital Raut	73

Generalized Inner Product Space

$$A = \{a_0G_0 + a_1G_1 + a_2G_2 / a_i \in F \& G_i \in C(P)\}$$

Where $C(P)$ = class of algebraic structures of codes in universe

- Dr. K.R. Nemade
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Abstract :

This piece of work consist of (A, \oplus) is an abelian group , (A, \oplus, \otimes) is a vector space , $(A, \oplus, \otimes) = A = \{a_0G_0 + a_1G_1 + a_2G_2 / a_i \in F \& G_i \in C(P)\}$
Where $C(P)$ = class of algebraic structures of codes in universe.; is a modified inner product space.

Mathematics Subject Classification 2000 : 08A99 , 03C13 , 68Q15 , 68Q19, 08A68

Keywords :

Binary Operation ,Abelian Group ,Vector Space , Inner Product, Field.

Introduction :

I.N.Herstein cotes in (1)

Definition : A nonempty set of elements G is said to form a group if in G there is defined a binary operation , called the product and defined by $*$, such that

1. $a, b \in G$ implies that $a*b \in G$
2. $a, b, c \in G$ implies that $(a*b)*c = a*(b*c)$
3. There exist an element $e \in G$ such that $a*e = e*a = a$ for all $a \in G$
4. For every $a \in G$ there exist an element $a^{-1} \in G$ such that $a*a^{-1} = a^{-1}*a = e$

Definition : A group G is said to be abelian (or Commutative) if for every $a, b \in G$,

$$a * b = b * a .$$

Definition : A nonempty set V is said to be vector space over a field F if V is an abelian group under an operation which we denote by $+$, and if for every $a \in F$, $v \in V$; there is defined an element , written as av , in V subject to

1. $a(v+w) = av + aw$;
2. $(a + b)v = av + bv$;
3. $a(bv) = (ab)v$;
4. $1v = v$;

For all $a, b \in F$; $v, w \in V$ Where the 1 represent the unit element of F under multiplication.