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NEW IDEALS AND FILTER OF ON BG-ALGEBRA

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Abstract: *In this work as we introduce AK-ideal-BG algebra. AK-filter Also, we give some theorems and relationships among them.*

INTRODUCTION

This concept is very important in the field of algebra and has great applications in the Internet and network science.

In (1966),Y. Imai and K. Is´eki introduced two classes of abstract algebras: BCK- algebras and BCI-algebras [3]. In (1999), J. Naggersand H. S.Kim introduced the notion of d-algebra, which is another use generalization of BCK-algebra [5]. In 1999J. Naggers, Y. B. Junand H. S. Kim introduced the notion of d-ideal in d- algebra[6]. In (2008) Chang Bum Kim, Hee Sik Kim introduces the notionon BG-algebras ON BG-ALGEBRAS [4]. In (2012)C. A.Muhammad and. F.Ali, introduced multipliers in d-algebras [1]. This paper's objective is to introduce new types ideal and filter on BG-algebra its called AK- ideal and AK- filter. Also this paper studied the relationships between them.

PRELIMINARIES

Definition (2.1)[4]:

A BG-algebrais a set $X$with a binary operation "$*$"which satisfies the following axioms:

1. $x*x=e$
2. $x*e=x$
3. $(x*y)*(e*y)=x$,For all$x,y,\in X$

***Example(2.2)*[4]**

suppose$X=\{e,a,b,\}$be asset with the following table:

$*$	e	a	b
e	e	a	b
a	a	e	a
b	b	b	e

Then$(X,*,e)$ isaBG-algebra Not : (2.3)

InBG-algebra$X$, we denoted$e*$ Xbyx^*forever y$x\in$X.

Definition(2.4)

If$(X,*,e)$be a BG-algebra and$I$be a non empty sub set of X.Then$I$
Is called an AK-ideal of X if for any $x,y\in X$,

1)$\in I$

(2)$x*y\in I$and $y\in I$ imply $x\in I$.

Remark(2,5)

1- $\{e\}$ and$X$areAK-idealsof X.$\{e\}$ and$X$are called thetrivial idealsofx

2- AnAK-ideal $I$of$X$issaid tobeproperif$I\neq X$.

Example (2.6):

If $X=\{e,a,b,c\}$ be a set as shown in the subsequent table

*	e	a	b	c
e	e	a	b	c
a	a	e	c	b
b	b	c	e	a
c	c	b	a	e

Then$(X,*,e)$is a BG-algebra .

$I_1=\{e,a\}$,thenIis a KA-Idel from X ,but $I_2=\{e,a,b\}$ is not ak- ideal of X,because $c*a=b\in I$, however $c\notin I$.

Proposition(2.7.):

The intersection of a family of AK-ideals of a BG-algebra is AK-ideal.

Proof:

Let$\{I_i,i\in\Delta\}$beafamilyof AK-idealsinBG-algebra$X$,so $e\in I_i,\forall i\in\Delta$,then$e\in\bigcap_{i\in\Delta}I_i$.

Now,let$x*y\in\bigcap_{i\in\Delta}I_i, y\in\bigcap_{i\in\Delta}I_i$ then$x*y\in I_i, y\in I_i, \forall\ i\in\Delta$,since$I_i$is ideal,$\forall\ i\in\Delta$,then$x\in I_i,\forall\ i\in\Delta$. Thus$x\in\bigcap_{i\in\Delta}I_i$.

Hence$\bigcap_{i\in\Delta}I_i$ isAK-ideal.

Remark(2.8)

The union of two Ak-idelin BG-algebrais not AK-idelingeneralas shown in the following example.

Example(2.9):

Let$X=\{e,a,b,c\}$andlet$*$abinary operation is defined on X by

*	e	a	b	c
e	□	a	b	c
□	□	e	c	b
□	b	c	e	a
□	□	a	a	e

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It is obvious that$(X,*,e)$ $is a$BG-algebra $and F_1=\{e,a\},F_2=\{e,a\}$are *Idel* in$XbutI_1 \cup I_2=\{e,a,b\}$is not a idel in X,since $(c*b)$ $=a\in$ $I_1 \cup I_2$,but$c\notin F_1 \cup F_2$.

PRELIMINARIES

In this portion, we provide definitions AK- *filter* in BG -algebra onxandstudy its relationshipsbetween them.

Definition(3.1)

A non empty subset F of a BG-algebra X is said to be AK-*filter if.*

1. $e\in F$
2. $(x^* * y^*)^* \in F, y \in F$.implies $x\in F$

Example(3.2)

Let$X = \{e,a,b,c\}$, is defined by

*	e	a	b	c
e	e	a	b	c
a	a	e	c	b
b	b	c	e	a
c	c	b	a	e

It is that $(X,*,e)$is BG-algebra and $F_1=\{e,a\}$ isAK-filter but

$F_2=\{e,a,b\}$is not AK- *filter*, since $(c*a)=b\in F_2$but$c\notin F_2$

Proposition (3.3):

The inter section of a family of AK-filter in BG-algebra x is a AK-filter.

Proof:

Let$\{F_i, i\in \lambda\}$ be a family of AK-*filters* in BG-algebra X, so$e\in F_i, \forall i\in \lambda$and then$e\in \bigcap_{i\in\lambda} F_i$,andlet$(x^* * y^*)^* \in \bigcap_{i\in\lambda} F_i, y\in \bigcap_{i\in\lambda} F_i$,then$(x^* * y^*)^* \in F_i, y\in F_i, \forall i\in\lambda$.Since$F_i$isAK-filter,$\forall i\in\lambda$,itfollowsthat$x\in F_i,\forall i\in\lambda$and hence$x\in \bigcap_{i\in\lambda} F_i$■

Remark:(3.4)

In general the union of two Ak-*filters* is not *filter* on BG- algebra as shown in the following example.

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Example(3.5):

Let$X = \{0,a, b,c\}$and a binary operation $*$ is defined by

*	e	a	b	c
e	e	e	e	e
a	a	e	c	b
b	b	c	e	a
c	c	b	a	e

It is clear that $(X,*,e)$ *is* BG-algebra X *and* $F_1 = \{e,a\}$,F_2=$\{e,b\}$ are AK-*filters* but$F_1 \cup F_2$=$\{e,a,b\}$is not AK-*filter*, since$(c^* * b^*)^* = a \in F_1 \cup F_2$,but $c \notin F_1 \cup F_2$

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