

### 169. Some Three Valued Logics and its Algebraic Representations

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In his papers [3], [4], A. Rose formulated a three valued logic given by the following matrices:

	$x$	0	1	2	
	$Nx$	2	1	0	

  

$\vee$	0	1	2	$\wedge$	0	1	2
0	0	0	0	0	0	1	2
1	0	0	1	1	1	2	2
2	0	1	2	2	2	2	2

and for the implication  $x \rightarrow y$ ,

$\rightarrow$	0	1	2
0	0	1	2
1	0	0	1
2	0	0	0

Where 0 is the designated value, and from  $N1=1$ , 1 is the center of this calculus.

Let  $\{0, 1, 2\}$  be a ring with characteristic 3 (see Gr. C. Moisil [1], [2]). Then these primitive functors are algebraically denoted by

$$\begin{aligned}
 Nx &= 2(x+1), \\
 x \vee y &= x^2y^2 + xy(x+y), \\
 x \wedge y &= 2x^2y^2 + 2xy(x+y) + (x+y),
 \end{aligned}$$

and

$$x \rightarrow y = x^2y^2 + xy(x+y) + 2xy + y.$$

Further, two functors  $\mu$  and  $\nu$  defined by

$x$	0	1	2
$\mu x$	0	2	2
$\nu x$	0	0	2

are represented by  $2x^2$  and  $x^2+2x$  respectively. These results are obtained by a similar way of Gr. C. Moisil [1].