

SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution) Coimbatore-641035.

UNIT 5- LATTICES AND BOOLEAN ALGEBRA

Some special lattices

Boolean Algebra: A complemented dects/butter lattice &
carred a Boolean Algebra
Bootean Identifies
1). Idempotent law & ana = 9
ava = q
2). Commutative law: and = bra
avb = bvq
3). Identity law: 01 = 9
avo = a dvo
4). Domphance law: arozo
8). Absosption law: av(anb) = 9
an (avb) =a
6), ana' = 0 y Demorigan's law
$ava' = 0$ $(a+b)' = a' \cdot b'$
Theorem ! 1 and $(a \cdot b)' = a' + b'$
PT 90 a BA a=0 9th ab'+a'b=b
ploof:
Agrume $a=0$ Now, $ab'+a'b-ab'+1.b$
= 0 + b
conversely.
Assume ab' + a' b = b
To prove a = 0
Now $ab'=b$ and $a'b=b$
a' = 1
$\sqrt{a}=0$



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For any BA, plove the following
D. x \vee y = x \vee x and \overline{x} \vee y = \overline{x} \vee x \Rightarrow y = \overline{x}
    2 × y = 0 966 x=0 and y=0
    2 = 9 98 2 NY = 0
in. 219=1 98 7=1 and y=1.
Perop:
           y = 9 vo
i). aon 29del
              = リソ (マハを)
              = (4 V x) 1 (4 V x)
              =(xvx) 1 (zevx)
               = (ストア)ソス
               三のイス
 (ii
         = 2 (4/4)
          = (x v y) 1 (x v y)
          = O / (Dev y)
          = 0
        y = 9 v o
and
            = 4 V (20/2)
            = (yvx) 1 (yvx)
            = の人(タンを)
            =0
 conversely,
     xvy = 0v0 = 0
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iii). Assume 2 29 >
TO PLOVE X 14 = 0
Noco
     ヒハイライカニアスス
          = 210
          ASSUMO 219=0
conversely,
Con 28 da
         ニマハー
          = X A ( 9Y F)
          =(スヘリ) ソ(スヘダン
           = ロソ (マハダ)
           = 219
       > x = 9
   Assure that
 To prove &=1 and y=1.
       X = X/I
         = 24 (449)
         = (2/4) V(2/4)
         = 1 V (メハザン
       9 = 911
 and
          = リハ (スレえ)
          = (AVA) A (AV X)
          = Y V (YA え)
 conversely, Assume x=1 and
    PLOVE 214=1
          マハリニノハニー
```