Q 1 8.1 a) 01 The Boolean empression implemented by the digital circuit is: Y = (¬A↑¬B) ↑ ((A↑B) ↑() Me can also write the above exp. as: 7 ((7(A^B))^7(7(A^B)^()) =7((77AV77B)~ (77(ANB) V7())) [Demongani, law] - (- (AVB) V - ((ANB)V-C) [double regation ? = ((-AA-B) V) (-(AAB) PA-TC)) (pe morganis bus) = ((7AN-B) V ((7AV-B) ^C) [darble negation] = (GAMB) V (GAMC) V (MBMC))) [Distributivity) = ((-AN-B) V (-A~C) V (-B~C))

The above eng. can also be written ((7AN-B^()) (7AN-B^-()) V (TANBAC) V (TANTBAC) V (AMBAC) V (7AMBAC)) mintern form and M, + M0 + M3 + M, + M5 + M, Mo+M,+M3+M5 (idempoterry) D.N 8/27 3-(AVB)VCin (out = (ANR) v (Cin n (AVB)) de wittenar. (7) (7AAB) V (AATR)) PACIN) M((BARBTY(AMB))) ~ ~ (in) (T((GANB) ~ Cin) V ((A) 12B) a Cin) (43 AON BY MC JUSTOV (AAA Chistoperficity]

Q M 8.2) 501

S= (AVB) V(in

(out = (AMB) v((in M(AVB))

for Sand Cow As the truth table is easier to Jollan than tru algebraic conjutation

A	B	Cin	S	Cont
0	O	0	0	٥
0	0	6:		D
D		0		0
0		1	0	1
	D	0		D
	0		0	
	- 1	٥	0	1. 4
	1	1	1	1
X	X	X	X	X

80, Sum for S is (7AABAG) V (7AABAG) V (AABAG) V (AABAG) The product for the S "": (-AV-BV-(in)^(-AVBVCin)^ (AVBVCin) ^ (AVBV-Cin) The sun for the Coutis! (A VAB V Cin) A (AABAGIN) V(JAABAGIN) V (AAABA (in) V(AABAcin) The product for Cont is: (TAVTBVTGin) AA (TAVTBV (in) ^ (-AVBV-Cin) ~ (AV-BV-Cin) SEA VB W(in = (AVB) V Cin = ((AVB) N(TAVQB)) V CIN = (7(7AA-B)/(7(AAR))) VCin [A Monganis lan ?)

() lets consider fox, y

X V y = ? (The ferms of 7 h 1)

. 1	×	Y	XAY	· (水介沙)	(x1y) 1 (x1y)	XVY
	0	0	1	(0	0	0
•	0	* \(\sqrt{\chi}				1
		b	J.			
			0		0	0

As we can see XVY is identical to (XTY) 1 GX 171)

$$x \dot{y} = (x \dot{y}) \uparrow (x \dot{y})$$

= ((A 1 B) 1 (-A1-R)) V (in - ((A1B) 1 GA1-B)) 1 Cin) 1 = (2(A + B) + (7A+B)) + 7(in) which is the required form consting only 1 and 7. Cont = (ANB) V ((in A (AVB)) = 7 (7AAB) V7 (7(IN A(AVB)) [obvious] = 7 ((A MB) ^ (a Cin 17 (A VB))) Le Morganis land = (-A+B) + (-(in +(AVB)) = (-A MB) + (Cin 1-1((A MB) 1 (GA AB))) Nich is the regimes form canistry only 1 and 7.

fig: Cont circuit