

Saturday December  
12-18-10  
CSCLB

## Final Exam

1.  $F \rightarrow T$  is a tautology?

F	T	F	T
T	T	T	
F	F	F	
F	T	T	
T	F	T	

False

2.  $P \wedge \neg P \in D$

Robust & P

invalid connectives

invalid connectives

(False?)

((P  $\wedge$  Q)  $\vee$  (P  $\wedge$  R))  $\vee$  (Q  $\wedge$  R)

3.  $A + T \cdot A$

for all and

$A \vee \neg A = A$

False

4.  $(P \rightarrow Q) \rightarrow (Q \rightarrow P) \rightarrow (P \rightarrow Q) \rightarrow (Q \rightarrow P)$  is a contradiction?

False

contradiction or question  
that is always false

$P \rightarrow Q$

$Q \rightarrow P$

P	Q	$P \rightarrow Q$	$Q \rightarrow P$	$P \rightarrow Q \rightarrow (Q \rightarrow P)$
T	T	T	T	T
T	F	F	F	T
F	T	T	F	F
F	F	T	F	F

P	Q	$P \rightarrow Q$	$Q \rightarrow P$	$P \rightarrow Q \rightarrow (Q \rightarrow P)$
T	T	T	T	T
T	F	F	F	T
F	T	T	F	F
F	F	T	F	F

5.  $(P \Rightarrow Q) \vee P$  is a tautology?

P	Q	$P \Rightarrow Q$	$(P \Rightarrow Q) \vee P$	X <sup>209</sup> X = and
T	T	T	T	
F	F	F	F	
F	T	T	T	True

6.  $(A' + B')' = BA$  A = and + = or

$$A' + B' \quad \text{so } \boxed{\text{False}} \quad \text{By De Morgan's Law}$$

7.  $((A' + A)' )' = 1$

$$A' + A = 1 \quad \boxed{\text{True}}$$

8.  $(A \cdot B)' \cdot A' = A' B'$

$$\cancel{AB}$$

$$A' A' \cdot B A'$$

$$A' \cdot B A' \quad (A' B) / = A' B'$$

$$A' + A B \quad A B$$

$$(A')' = A' B'$$

$$A = A' B'$$

**False**

Q.27

$$a. (A+B) \cdot A' = A' \cdot B \quad \text{Add } + = 0$$

$$AA' + BA' = A' \cdot B$$

$$0 + BA' = A' \cdot B$$

True

$$A'B = A'B$$

$$10. (B + (A+A)) = 1$$

$$B + 1 = 1$$

True

$$1 = 1$$

\* uses right expression  
if  $a^*a = a^+$

$$a^*a = a^+$$

True

\*  $= 0$  or nos  
 $+ = 1$  or nos

$$11. (a^* + \lambda)ba = ba + ba \quad + 2 \text{ un} - 2a = V$$

$$(a^* + \lambda)ba = \{ba, aba, ala\}, \dots$$

$$ba^* + ba = \{ba,$$

False

13.  $L = (a+b)^*c(a+b)^*$  or  $b$  added to  $\Sigma^*ab\Sigma^*$

$L(a)$  includes: 0000111?

0000111 True

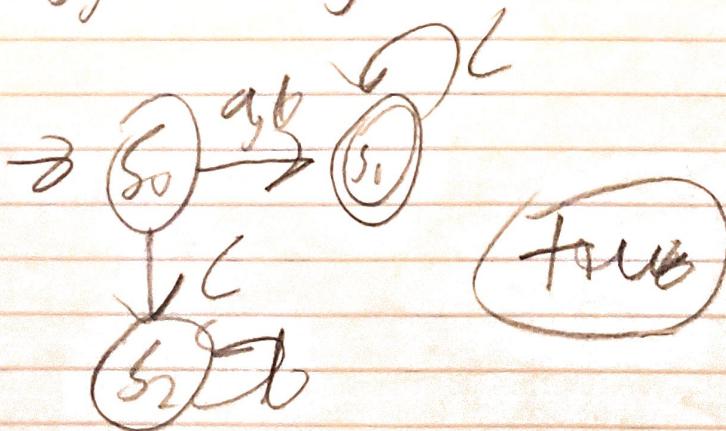
14.  $L(a+b)^*a(b+a)^*$  with alphabet  $\Sigma \neq ab$

$L(a+b)^*a(b+a)^*$  with alphabet  $\Sigma \neq ab$  + two cases

$L(a)$ ,  $L(b)$  are closed under  $\Sigma^*$  and  $a$  and  $b$  are disjoint  
or no occurrences of  $a$  or  $b$  in  $L$ .

True?

15.  $L(a), a = (a+b)c^*$ ?



True

16.  $2 + (-2)$

$$000010 \rightarrow 11101\cancel{0}1$$

$$\begin{array}{r} \cancel{000010} \\ - 000010 \\ \hline 11110 \\ + 1 \\ \hline 11110 \end{array}$$
$$\begin{array}{r} 000010 \rightarrow 2 \\ + 11110 \rightarrow -2 \\ \hline 000000 \end{array}$$

(True)

17. 32.5

No expected of 2 is 5 check adding 127 to 5?

$$\begin{array}{r} 2 | 32 \\ 2 | 16 \\ 2 | 8 \\ 2 | 4 \\ 2 | 2 \\ 2 | 1 \\ 2 | 0 \end{array}$$

00100000 5

10010000

1.00000 x (F)

(True)

U.S. 1.5 in 0000 0010

2.5@121.011

$$0 \neq L^2 = 0,0,0$$

~~31190~~ 1000000

II] w xz<sup>1</sup>

10130 ①

19

Peter

20. 2001 → WHO by 2's constraint?

2001

13

$$1110 \rightarrow 111$$

*Palso*

21. Regatta S!

A handwritten musical staff on lined paper. The staff consists of five horizontal lines. There are two vertical bar lines dividing the staff into measures. The first measure contains a note with a vertical stem and a short horizontal stroke at the top. The second measure contains a note with a vertical stem and a short horizontal stroke at the bottom. The third measure contains a note with a vertical stem and a short horizontal stroke at the top. The fourth measure contains a note with a vertical stem and a short horizontal stroke at the bottom. The fifth measure contains a note with a vertical stem and a short horizontal stroke at the top. The first three measures are enclosed in a large circle.

Falso

22.6 by 11<sup>1</sup>/<sub>2</sub> crossed by 10<sup>1</sup>/<sub>2</sub>?

$$\begin{array}{r} \cancel{X} \cancel{V} \cancel{5} \cancel{1} \\ \hline 000 \\ 001 \\ \hline 0 \end{array}$$

*Cont'd*

FIVE STAR  
\*\*\*\*\*

FIVE STAR  
\*\*\*\*\*

FIVE STAR.  
\*\*\*\*\*

FIVE STAR.  
\*\*\*\*\*

22.

(cont'd)

X	V	2		f
0	0	0		Ø
0	0	1		Ø
0	1	0		Ø
0	1	1		Ø
1	0	0		Ø
1	0	1		Ø
1	1	0		Ø
1	1	1		Ø

X' Y' 2?

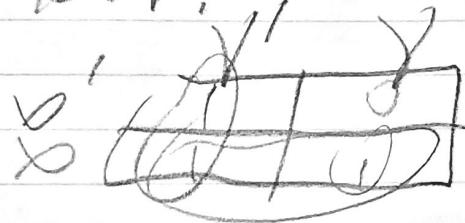
[Dale]

(1)

= V2 V2 V2 V2  
X 0 3 4  
X 5 6 7

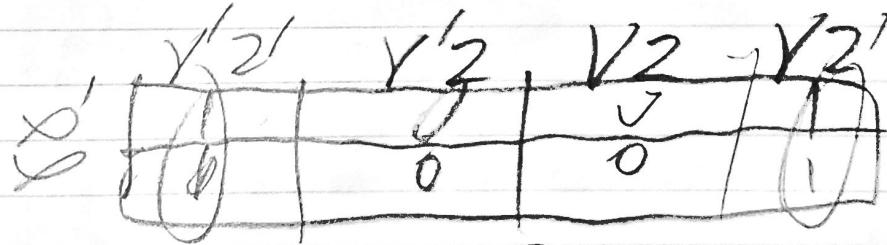
23.

X' Y'?



V' + X True

24.



(2)

[Dale]

26. 1.73

00000010

$$\begin{array}{r} 4190 \\ \times 27 \\ \hline 28 \\ 1.0 \end{array} \quad \boxed{00000010}$$

$\boxed{1.0} \times 2^1 \rightarrow 27 + 1 = 28$

2

10000000

$$\begin{array}{r} 73 \times 2^2 = 146 \\ 30 \times 2^2 = 120 \\ 0 \times 2^3 = 0.0 \end{array}$$

$$\boxed{\text{II}} \quad 101100$$

0

AB'

27 (AB)A'

A'B + BA'

(AB + AB')

A(B + B')

A + 12A

FIVE STAR  
★★★

FIVE STAR  
★★★

FIVE STAR  
★★★

FIVE STAR  
★★★

29. a)  $\frac{T}{5} \rightarrow T$   
 $7P \rightarrow 7T$

composites

$\therefore 19P$

b) ~~start~~ reached

C P2a

~~28~~

$\therefore 79 \rightarrow 7P$