

EXERCISES FOR SECTION 3.6

PART I: TESTING FOR CONSISTENCY

(Note: You can find solutions to the odd-numbered problems in the authors' solutions manual, which you can find at the following web site: <http://blue.butler.edu/~sglennan/SSM.pdf>.)

2. This set of statements is *inconsistent*.

P	Q	Q	\rightarrow	\sim	P	P	Q
T	T	T	F	F	T	T	T
T	F	F	T	F	T	T	F
F	T	T	T	T	F	F	T
F	F	F	T	T	F	F	F

4. This set of statements is *consistent*, as is shown on the second line of the truth table.

P	Q	\sim	(P & Q)	P	&	\sim	Q
T	T	F	T	T	F	F	T
T	F	T	F	T	T	T	F
F	T	T	F	F	F	F	T
F	F	T	F	F	F	T	F

6. This set of statements is *consistent*, as is shown on the second line of the truth table.

A	B	A	&	(\sim A \rightarrow A)	B	\rightarrow	\sim	A
T	T	T	T	F	T	F	F	T
T	F	T	T	F	T	T	F	T
F	T	F	F	T	F	T	T	F
F	F	F	F	T	F	T	T	F

8. This set of statements is *consistent*, as is shown on the fourteenth line of the truth table.

A	B	C	D	\sim	A	\sim	B	(A & B)	\vee	(C \vee D)	\sim	D
T	T	T	T	F	T	F	T	T	T	T	F	T
T	T	T	F	F	T	F	T	T	T	T	T	F
T	T	F	T	F	T	F	T	T	T	F	T	T
T	T	F	F	F	T	F	T	T	T	F	F	F
T	F	T	T	F	T	T	F	T	F	T	T	T
T	F	T	F	F	T	T	F	T	F	T	T	F
T	F	F	T	F	T	T	F	T	F	F	T	T
T	F	F	F	F	T	T	F	T	F	F	F	F
F	T	T	T	T	F	F	T	F	F	T	T	T
F	T	T	F	T	F	F	T	F	F	T	T	F
F	T	F	T	T	F	F	T	F	F	T	T	T
F	T	F	F	T	F	F	T	F	F	F	F	F
F	F	T	T	T	F	T	F	F	F	T	T	T
F	F	T	F	T	F	T	F	F	F	T	T	F
F	F	F	T	T	F	T	F	F	F	F	T	T
F	F	F	F	T	F	T	F	F	F	F	F	F

10. This set of statements is *inconsistent*.

A	B	C	D	\sim	(A \rightarrow B)	C	\leftrightarrow	B	\sim	(C \rightarrow D)
T	T	T	T	F	T	T	T	T	F	T
T	T	T	F	F	T	T	T	T	T	F
T	T	F	T	F	T	T	T	F	F	T
T	T	F	F	F	T	T	T	F	F	T
T	F	T	T	T	T	F	F	T	F	T
T	F	T	F	T	T	F	F	T	T	F
T	F	F	T	T	T	F	F	T	F	T
T	F	F	F	T	T	F	F	T	F	F
F	T	T	T	F	F	T	T	T	F	T
F	T	T	F	F	F	T	T	T	T	F
F	T	F	T	F	F	T	T	T	F	T
F	T	F	F	F	F	T	T	T	F	F
F	F	T	T	F	F	T	F	F	F	T
F	F	T	F	F	F	T	F	F	T	F
F	F	F	T	F	F	T	F	F	F	T
F	F	F	F	F	F	T	F	F	F	F

12. This set of statements is *consistent*, as is shown on the last four lines of the truth table.

L	M	P	R	M	\rightarrow	(P & \sim P)	M	\rightarrow	(R \vee L)	\sim	L
T	T	T	T	T	F	T	F	T	T	T	F
T	T	T	F	T	F	T	F	T	F	T	F
T	T	F	T	T	F	F	T	F	T	T	F
T	T	F	F	T	F	F	T	F	T	T	F
T	F	T	T	F	T	T	F	F	T	T	F
T	F	T	F	F	T	T	F	F	T	T	F
T	F	F	T	F	T	F	T	F	T	T	F
T	F	F	F	F	T	F	T	F	T	T	F
F	T	T	T	T	F	T	F	T	T	F	T
F	T	T	F	T	F	T	F	T	F	F	T
F	T	F	T	T	F	F	T	F	T	F	T
F	T	F	F	T	F	F	T	F	T	F	T
F	F	T	T	F	T	T	F	T	T	F	T
F	F	T	F	F	T	T	F	T	T	F	T
F	F	F	T	F	T	F	T	F	T	F	T
F	F	F	F	F	T	F	T	F	T	F	T

14. This set of statements is *inconsistent*.

H	J	K	(J \vee K)	&	H	\sim	J	\vee	H	H	\rightarrow	\sim	H
T	T	T	T	T	T	F	T	T	T	T	F	F	T
T	T	F	T	T	T	F	T	T	T	T	F	F	T
T	F	T	F	T	T	T	F	T	T	T	F	F	T
T	F	F	F	F	F	T	F	T	T	T	F	F	T
F	T	T	T	T	T	F	T	F	F	F	T	T	F
F	T	F	T	T	F	F	T	F	F	F	T	T	F
F	F	T	F	T	F	T	F	T	F	F	T	T	F
F	F	F	F	F	F	T	F	T	F	F	T	T	F

16. This set of statements is *inconsistent*.

X	Y	Z	W	$\sim X$	$\vee (\sim Y \vee (Z \& W))$	$\sim (\sim X \vee \sim Y)$	$\& \sim W$
T	T	T	T	F	T	T	F
T	T	T	F	F	T	F	T
T	T	F	T	F	T	F	F
T	T	F	F	F	T	F	F
T	F	T	T	F	T	T	F
T	F	T	F	F	T	T	F
T	F	F	T	F	T	F	F
T	F	F	F	F	T	F	F
F	T	T	T	T	F	T	F
F	T	T	F	T	F	T	F
F	T	F	T	T	F	F	F
F	T	F	F	T	F	F	F
F	F	T	T	T	F	T	F
F	F	T	F	T	F	T	F
F	F	F	T	T	F	F	T
F	F	F	F	T	F	F	F

18. This set of statements is *consistent*, as is shown on the last line of the truth table.

A	B	C	D	$A \rightarrow (B \& C)$	$(C \vee D) \rightarrow A$	$\sim B$	$A \rightarrow C$
T	T	T	T	T	T	F	T
T	T	T	F	T	T	F	T
T	T	F	T	T	T	F	F
T	T	F	F	T	T	F	F
T	F	T	T	T	T	T	T
T	F	T	F	T	T	T	T
T	F	F	T	T	T	T	F
T	F	F	F	T	T	T	F
F	T	T	T	F	T	F	T
F	T	T	F	F	T	F	T
F	T	F	T	F	T	F	F
F	T	F	F	F	T	F	F
F	F	T	T	F	T	T	T
F	F	T	F	F	T	T	T
F	F	F	T	F	T	F	F
F	F	F	F	F	T	F	F

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