Answers

1. (a) T: True/asserted F: False/negated

driver_present	buckled_up	ignition_on	warning_light
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1 (T)	0 (F)	1 (T)	**1 (T)**
1	1	0	0
1	1	1	0

(b) warning_light = (driver_present) (buckled_up)' (ignition_on)

2. (a) T: True/asserted F: False/negated

driver_present*	buckled_up*	ignition_on*	warning_light*
0	0	0	1
0	0	1	1
0 (T)	1 (F)	0 (T)	**0 (T)**
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

(b) warning_light* = driver_present* + (buckled_up*)' + ignition_on*

3. (a) T: True/asserted F: False/negated

driver_present*	buckled_up*	ignition_on	warning_light
0	0	0	0
0	0	1	0
0	1	0	0
0 (T)	1 (F)	1 (T)	**1 (T)**
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

(b) warning_light = (driver_present*)' (buckled_up*) (ignition_on)

or warning_light = [driver_present* + (buckled_up*)' + ignition_on']'

4. F=1 when A=1 or C*=0 but not both; and B=0 or D*=1 but not both.

A	B	C*	D*	F
0	0	0	0	**1**
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	**1**
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	**1**
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	**1**

$$F(A,B,C^*,D^*) = \sum m\ (0, 5, 10, 15)$$

Active-high signals: True (asserted) when the signal is high

Active-low signals: True (asserted) when the signal is low