Problem 5.3 Basic Definitions

Answer:

According to the problem description,

- $V = \{a, b, c, d\}$
- $D_a = bool, D_b = D_c = \{0, 1, 2, 3\}, D_d = \{0, 1, 2, 3, 4, 5, 6\}$
- $C: if\ a\ then\ b \leq 2; if\ c < 2\ then\ a; b + c < 4; b > d; d = 2c$

Assignment of variables:

a	b	c	d	$if\ a\ then\ b \leq 2$	$if\ c < 2\ then\ a$	$b + c < 4$	$b > d$	$d = 2c$	Partial (P) or Total (T)	Consistent or Inconsistent	Solution
F	-	-	-	F	T	T	T	T	P	IC	No
***									P	IC	No
F	0	0	0	F	F	T	F	T	T	IC	No
***									T	IC	No
T	-	-	-	T	T	T	T	T	P	C	No
T	0	-	-	T	T	T	T	T	P	C	No
T	1	-	-	T	T	T	T	T	P	C	No
T	2	-	-	T	T	T	T	T	P	C	No
T	3	-	-	F	T	T	T	T	P	IC	No
***									P	C/IC	No
T	0	0	0	T	T	T	F	T	T	IC	No
T	0	0	1	T	T	T	F	F	T	IC	No
***									T	IC	No
T	1	0	0	T	T	T	T	T	T	C	Yes
T	1	0	1	T	T	T	F	F	T	IC	No
***									T	IC	No
T	2	0	0	T	T	T	T	T	T	C	Yes
T	2	0	1	T	T	T	T	F	T	IC	No
***									T	IC	No
T	2	1	0	T	T	T	T	F	T	IC	No
T	2	1	1	T	T	T	T	F	T	IC	No
***									T	IC	No

According to the above table,

1. All solutions: $a = True, b \in \{1, 2\}, c = 0, d = 0$
2. An inconsistent total assignment: $a = False, b = 0, c = 0, d = 0$
3. All consistent partial assignment α such that $dom(\alpha) \in \{a, b\}$: $a = True, b \in \{1, 2\}$