

Problem #1 7-10

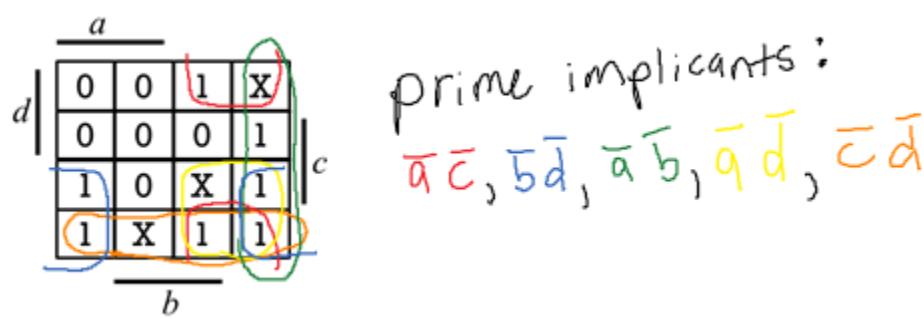
7)

Bar Value	Binary Representation
1.5	0000
2	0001
2.5	0011
3	0010
3.5	0110
4	0111
5	0101
5.5	0100
6	1100
7	1101
8	1111
9	1110

Used gray code because converting from analog to binary signal.

8)

a.



b.

	<u>a</u>		
<u>d</u>	0 0	1	X
	0 0	0	1
	1 0	X	1
	1 X	1	1
	<u>b</u>		

non-essential prime
implicants:
 $\bar{a}\bar{d}$, $\bar{c}\bar{d}$

c.

	<u>a</u>		
<u>d</u>	0 0	1	X
	0 0	0	1
	1 0	X	1
	1 X	1	1
	<u>b</u>		

minimum SOP:
 $F = \bar{a}\bar{c} + \bar{b}\bar{d} + \bar{a}\bar{b}$

d.

	<u>a</u>		
<u>d</u>	0 0	1	X
	0 0	0	1
	1 0	X	1
	1 X	1	1
	<u>b</u>		

minimum POS:
 $F = (\bar{a} + \bar{d})(\bar{b} + \bar{c})$

9)

$$23.15_{10} = 10111.0010_2$$

~~$23_{10} = 10111_2$~~

$$0.15_{10} \cdot 2_{10} = 0.30_{10}$$

$$0.30_{10} \cdot 2_{10} = 0.60_{10}$$

$$0.60_{10} \cdot 2_{10} = 1.20_{10}$$

$$0.20_{10} \cdot 2_{10} = 0.40_{10}$$

$$0.15_{10} = 0.0010_2$$

$$31.11_{10} = 11111.0001_2$$

~~$31_{10} = 11111_2$~~

$$0.11_{10} \cdot 2_{10} = 0.22_{10}$$

$$0.22_{10} \cdot 2_{10} = 0.44_{10}$$

$$0.44_{10} \cdot 2_{10} = 0.88_{10}$$

$$0.88_{10} \cdot 2_{10} = 1.76_{10}$$

$$0.11_{10} = 0.0001_2$$

$$\begin{array}{r} 1111 \\ 10111.0010_2 \\ + 1111.0001_2 \\ \hline 11010.0011_2 \end{array}$$

10)

a)

$$478_9$$

$$Y = 0$$

$$Y = 0 \cdot q_{11} + 4_{11} = 4_{11}$$

$$Y = 4_{11} \cdot q_{11} + 7_{11} = 3A_{11}$$

$$Y = 3A_{11} \cdot q_{11} + 8_{11} = \boxed{32A_{11}}$$

b)

$$56789_{10} = 1MUV9_{64}$$

0101 0110 0111 1000 1001₂

↓ ↓ ↓ ↓ ↓

1 22 30 9 64