JAWABAN UTS Ganjil TA 2022/2023

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1. a. Hitunglah nilai Decimal, biner, octal, atau hexa decimal untuk melengkapi tabel

Decimal	Biner	Octal	Hexa-Decimal
343.125	101010111.001	527.1	157.2
1312	0101 0010 0000	2440	520

343.125

- Biner

343
2 _____ 1
171
2 _____ 1
85
2 _____ 1
42
2 _____ 0
21
2 _____ 1
10
2 _____ 0
5
2 _____ 1
2
2 _____ 0
1

0.125 x 2 = 0.25
0.25 x 2 = 0.5
0.5 x 2 = 1.0

001

101010111
101010111.001

- Octal

343
8 _____ 7
42
8 _____ 2
5
527.1

0.125 x 8 = 1.0

- Octal

343   0.125 x 16 = 2.0
16 _____ 7
21
16 _____ 5
1
157.2

2440

- Decimal

2x8^3 + 4x8^2 + 4x8^1 + 0x8^0
= 2x512 + 4x64 + 4x8 + 0
= 1024 + 256 + 32
= 1312

- Biner

2 4 4 0
010 100 100 000
0101 0010 0000

- Hexa-Decimal

Diambil dari 0101 0010 0000 menjadi
520

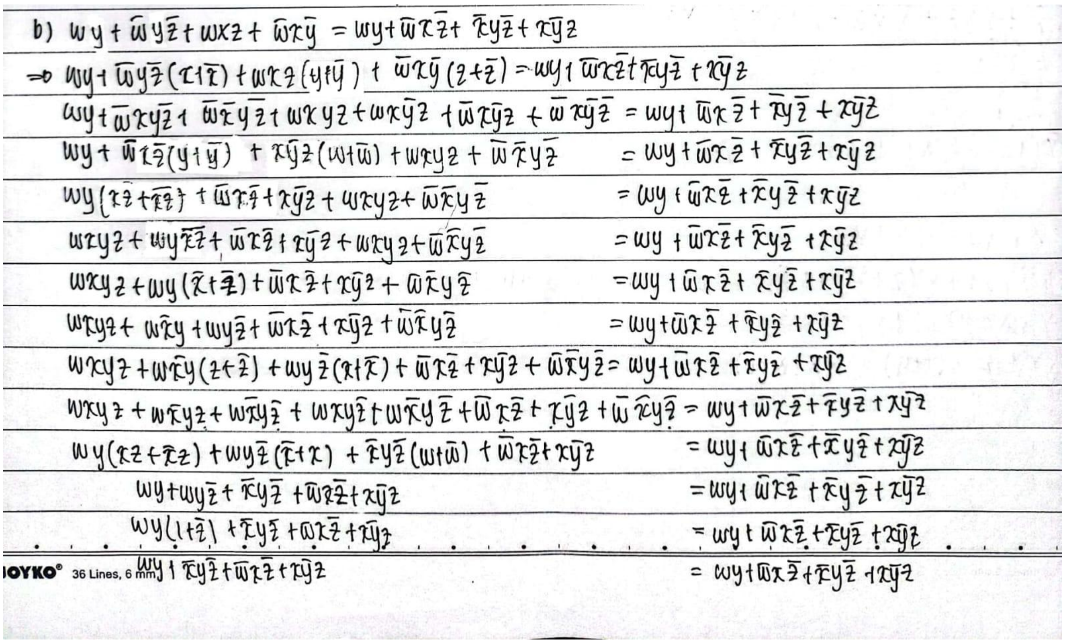
b. i) 3+4
3 => 0011
4 => 0100
______+
0111 => 7

ii)3–4 = 3+(-4)
3 => 0011   4 => 0100
-4 => 1100
______ +
1111 => –1

Untuk mencari biner –4
4 => 0100
=> 1011 (1’s complement)
0001 (ditambah dengan biner 1)
______ +
1100 => –4

c. 1001001 = 64+8+1 = 73 => I
1101110 = 64+32+8+4+2 = 110 => n
1100110 = 64+32+4+2 = 102 => f
1101111 = 64+32+8+4+2+1 = 111 => o
1110010 = 64+32+16+2 = 114 => r
1101101 = 64+32+8+4+1 = 109 => m
1100001 = 64+32+1 = 97 => a
1110100 = 64+32+16+4 = 116 => t
1101001 = 64+32+8+1 = 105 => i
1101111 = 64+32+8+4+2+1 = 111 => o
1101110 = 64+32+8+4+2 = 110 => n
Information

2. a. Pembuktian dengan aljabar Boolean



b) $wy + \bar{w}y\bar{z} + wxz + \bar{w}x\bar{y} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$\Rightarrow wy + \bar{w}y\bar{z}(x+\bar{x}) + wxz(y+\bar{y}) + \bar{w}x\bar{y}(z+\bar{z}) = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy + \bar{w}xy\bar{z} + \bar{w}\bar{x}y\bar{z} + wxyz + wx\bar{y}z + \bar{w}x\bar{y}z + \bar{w}x\bar{y}\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy + \bar{w}x\bar{z}(y+\bar{y}) + x\bar{y}z(w+\bar{w}) + wxyz + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy(xz+\bar{x}\bar{z}) + \bar{w}x\bar{z} + x\bar{y}z + wxyz + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wxyz + wy\bar{x}\bar{z} + \bar{w}x\bar{z} + x\bar{y}z + wxyz + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wxyz + wy(\bar{x}+\bar{z}) + \bar{w}x\bar{z} + x\bar{y}z + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wxyz + w\bar{x}y + wy\bar{z} + \bar{w}x\bar{z} + x\bar{y}z + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wxyz + w\bar{x}y(z+\bar{z}) + wy\bar{z}(x+\bar{x}) + \bar{w}x\bar{z} + x\bar{y}z + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wxyz + w\bar{x}yz + w\bar{x}y\bar{z} + wxy\bar{z} + w\bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z + \bar{w}\bar{x}y\bar{z} = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy(xz+\bar{x}z) + wy\bar{z}(\bar{x}+x) + \bar{x}y\bar{z}(w+\bar{w}) + \bar{w}x\bar{z} + x\bar{y}z = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy + wy\bar{z} + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy(1+\bar{z}) + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

$wy + \bar{x}y\bar{z} + \bar{w}x\bar{z} + x\bar{y}z = wy + \bar{w}x\bar{z} + \bar{x}y\bar{z} + x\bar{y}z$

b. Gambarkan tabel kebenaran dari fungsi ini dan nyatakan fungsi F dalam bentuk sum of minterm

	W	X	Y	Z	WXY’	WXZ’	WXZ	YZ’	WXY’+WXZ’+WXZ+YZ
0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	0	0	0	0
2	0	0	1	0	0	0	0	1	1
3	0	0	1	1	0	0	0	0	0
4	0	1	0	0	0	0	0	0	0
5	0	1	0	1	0	0	0	0	0
6	0	1	1	0	0	0	0	1	1
7	0	1	1	1	0	0	0	0	0
8	1	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	0
10	1	0	1	0	0	0	0	1	1
11	1	0	1	1	0	0	0	0	0
12	1	1	0	0	1	1	0	0	1
13	1	1	0	1	1	0	1	0	1
14	1	1	1	0	0	1	0	1	1
15	1	1	1	1	0	0	1	0	1

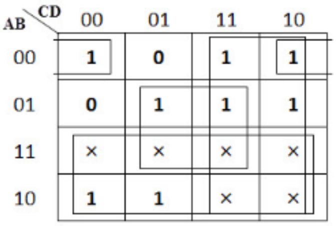
Sum of minterm = 2, 6, 10, 12, 13, 14. 15

3. - Membuat tabel kebenaran

A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	1	1	1	1	1	1	0
0	0	0	1	0	1	1	0	0	0	0
0	0	1	0	1	1	0	1	1	0	1
0	0	1	1	1	1	1	1	0	0	1
0	1	0	0	0	1	1	0	0	1	1
0	1	0	1	1	0	1	1	0	1	1
0	1	1	0	1	0	1	1	1	1	1
0	1	1	1	1	1	1	0	0	0	0
1	0	0	0	1	1	1	1	1	1	1
1	0	0	1	1	1	1	1	0	1	1
1	0	1	0	x	x	x	x	x	x	x
1	0	1	1	x	x	x	x	x	x	x
1	1	0	0	x	x	x	x	x	x	x
1	1	0	1	x	x	x	x	x	x	x
1	1	1	0	x	x	x	x	x	x	x
1	1	1	1	x	x	x	x	x	x	x

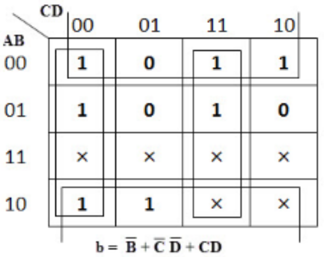
- KMAP

  Masukkan hasil dari setiap kolom di a, b, c, d, e, f, g pada KMAP



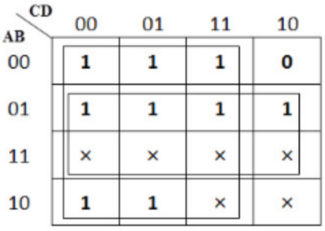
AB CD	00	01	11	10
00	1	0	1	1
01	0	1	1	1
11	×	×	×	×
10	1	1	×	×

$a = A + C + BD + \overline{BD}$



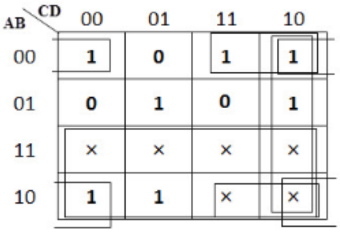
AB CD	00	01	11	10
00	1	0	1	1
01	1	0	1	0
11	×	×	×	×
10	1	1	×	×

$b = \overline{B} + \overline{C}\,\overline{D} + CD$



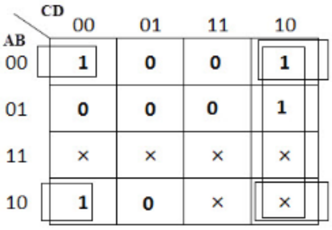
AB CD	00	01	11	10
00	1	1	1	0
01	1	1	1	1
11	×	×	×	×
10	1	1	×	×

$c = B + \overline{C} + D$



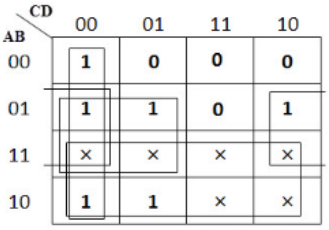
AB CD	00	01	11	10
00	1	0	1	1
01	0	1	0	1
11	×	×	×	×
10	1	1	×	×

$d = \overline{B}\,\overline{D} + C\overline{D} + B\overline{C}D + \overline{B}C + A$



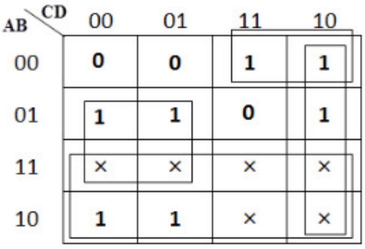
AB CD	00	01	11	10
00	1	0	0	1
01	0	0	0	1
11	×	×	×	×
10	1	0	×	×

$e = \overline{B}\,\overline{D} + C\overline{D}$



AB CD	00	01	11	10
00	1	0	0	0
01	1	1	0	1
11	×	×	×	×
10	1	1	×	×

$f = A + \overline{C}\,\overline{D} + B\overline{C} + B\overline{D}$



AB CD	00	01	11	10
00	0	0	1	1
01	1	1	0	1
11	×	×	×	×
10	1	1	×	×

$g = \overline{B}C + C\overline{D} + B\overline{C} + B\overline{C} + A$

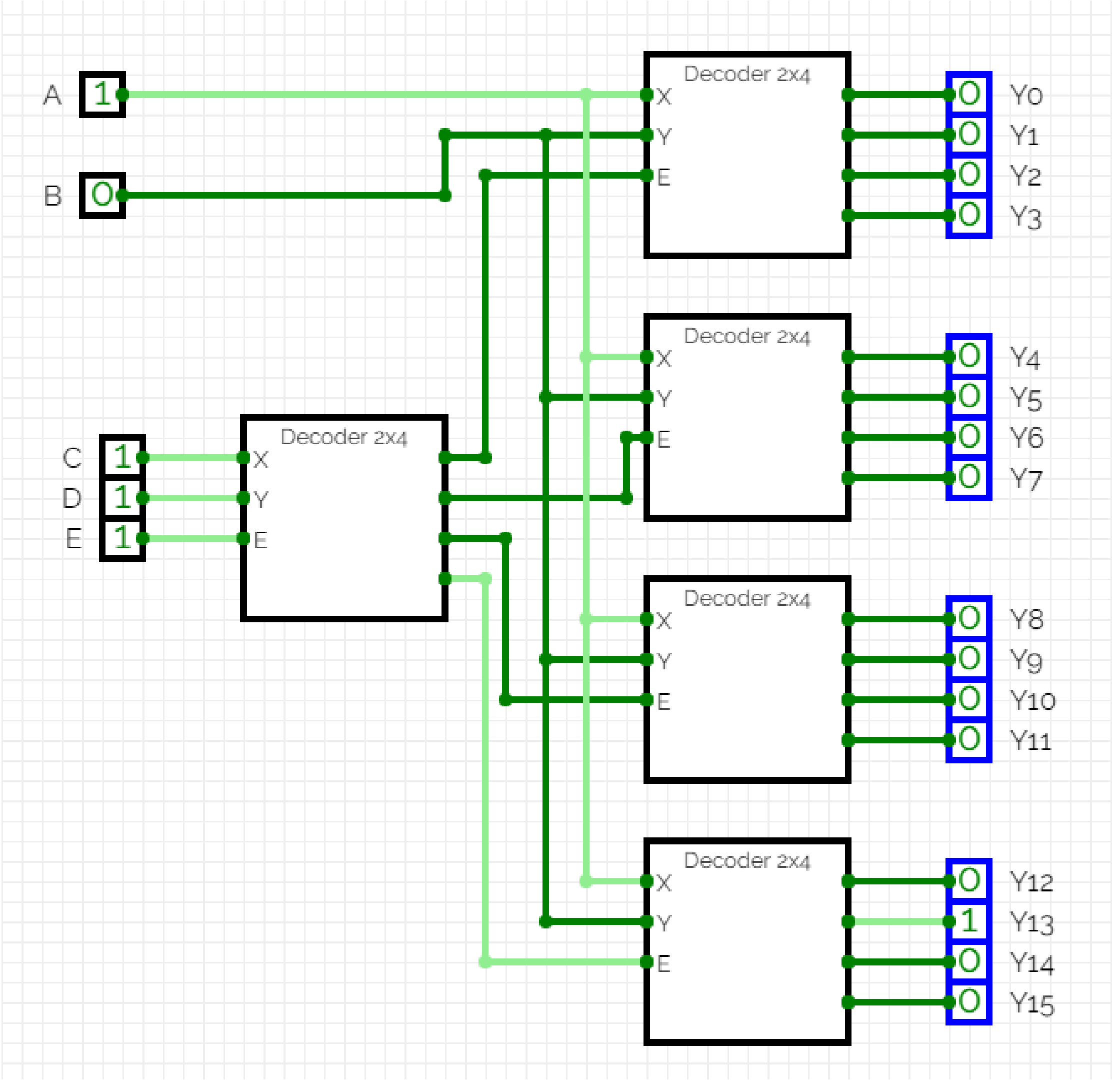
4. a. 10101110

Select line 011 => 3

Kemudian dicari pada data pada posisi ke 3 menunjukkan nilai 1 (10101110)

Y = 1

b.


A
1
B
0
C
D
E
1
1
1
Decoder 2x4
X
Y
E
Decoder 2x4
X
Y
E
Decoder 2x4
X
Y
E
Decoder 2x4
X
Y
E
Decoder 2x4
X
Y
E
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y11
Y12
Y13
Y14
Y15
0
0
0
0
0
0
0
0
0
0
0
0
0
1
0
0