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Birzeit University
Computer Systems Engineering Department
First Semester, 2024/2015
Digital Systems - ENCS2340

Quiz# 1

Name: [Redacted]

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1. Convert the following decimal number to binary 37.375

$(37.375)_{10} \rightarrow (\quad)_2$
 $37 + .375 \rightarrow$
 $= (100101.011)$

32	2
16	1
8	0
4	1
2	0
1	0
0	1

$.375$
 $0.375 \times 2 = 0.75$
 $0.75 \times 2 = 1.5$
 $0.5 \times 2 = 1.0$
 $1.0 \times 2 = 2.0$
 0.000

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2. Represent the following number (-71) using 2's complements with 8-bits representation?

~~71 in binary~~ \rightarrow 2's comp for (-71) it's (71) "(-71)"

71 in binary:

2 ⁷	2
32	1
16	1
8	1
4	0
2	0
1	0
0	1

$\Rightarrow (1000111) = 2's \text{ comp. for } (-71)$

71 not $\frac{-71}{2}$ 9/2

3. Find the complement of the following function in SOM-format.

$F(x,y,z) = xy + xz$
 $= xyz + xy\bar{z} + x\bar{y}z + x\bar{y}\bar{z}$
 $= \Sigma(7, 6, 1, 0)$

$= xyz + xy\bar{z} + x\bar{y}z + x\bar{y}\bar{z}$
 $= 7 + 6 + 3 + 1$

$F' = \Sigma(0, 2, 3, 4)$

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4. Reduce the following expression as much as possible?

$$F(A,B,C) = AB + (AC)' + AB'C(AB+C)$$

$$= (\overline{AB}) + (A' + C') + (AB'C + AB\theta'C)$$

$$= \overline{(A \cdot A)} +$$

$$= \overline{(A \cdot (A' + C'))} + B$$

$$= (\overline{A + A' + C'}) + (B + A' + C') + (AB'C + AB\theta'C)$$

$$= (\overline{1 + C'}) + (B + A' + C') + (AB'C + AB\theta'C)$$

$$= (\overline{C'}) + (B + A' + C') + (AB'C + AB\theta'C)$$

$$= (B + A' + C') + AB'C$$

$$= (B + A' + C') \cdot A + (B + A' + C') \cdot \theta' +$$

$$C \cdot (B + A' + C')$$

$$= AC' + 0 + AB + A'\theta + A'\theta' + CB + CA'$$

~~AB~~

$$= AC' + AB + A'\theta + A'\theta' + CB + CA'$$

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~~2/4~~