

Oct: 137450.506

Baskent University
Dept. Of Electrical-Electronics Engineering
EEM 211 - Digital Logic Design
Quiz 1 (B)

Student Name-Surname: Answer Key

Number:

- 1) The signed binary number below is calculated by 2's complement. Find;
 a) unsigned binary equivalent and
 b) decimal equivalent of this number.

10110010 a) Take 2's complement of the number: 01001110
 b) $10110010 = -01001110 = -(2^1 + 2^2 + 2^3 + 2^6) = -78$

- 2) a. Find 9's and 10's complement of $(18)_{10}$.
 b. Find 4's and 5's complement of $(34)_5$.

a) 9's complement:
 $(10^2 - 1) - 18 = 99 - 18 = 81$

10's complement:
 $(10^2 - 18) = [(10^2 - 1) - 18] + 1 = 82$

b) 4's complement:
 $((100 - 1) - 34)_5 = (44 - 34)_5 = (10)_5$

5's complement:
 $(10)_5 + (1)_5 = (11)_5$

- 3) Convert $(-10)_{10}$ into 8-bit binary numbers by using signed-magnitude and 2's complement representations. Before showing the negative numbers, first show the binary equivalent of the positive value.

Binary	Signed-Magn	2's comp
00001010	10001010	11110110

- 4) Calculate $95 + 27$ by using Binary Coded Decimal (BCD) system. Show the result in decimal and BCD form.

$\begin{array}{r} 95 \\ + 27 \\ \hline 122 \end{array}$	$\begin{array}{r} 1001 \ 0101 \\ + 0010 \ 0111 \\ \hline 1011 \ 1100 \\ + 0110 \ 0110 \\ \hline 10010 \ 0010 \end{array}$
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- 5) Express $(8A3B.F2)_{16}$ in binary and octal.

Bin: 1000 1010 0011 1011 . 1111 0010

00100010100011011.111100100

Oct: 105073.744