

Computer Organization (Revision)-Assignment-1

1	Simplify the following expressions using Boolean algebra. a. $A + AB$ b. $AB + AB'$ c. $A'BC + AC$ d. $A'B + ABC' + ABC$
2	Given the Boolean function $F = xy'z + z'y'z + xyz$ a. List the truth table of the function. b. Draw the logic diagram using the original Boolean expression. c. Simplify the algebraic expression using Boolean algebra.
3	Simplify the following Boolean functions using three-variable maps. a. $F(x,y,z) = (0, 1, 5, 7)$ b. $F(x,y,z) = (1, 2, 3, 6, 7)$ c. $F(x, y, z) = (3, 5, 6, 7)$ cl. $F(A,B, C) = (0, 2, 3, 4, 6)$
4	Decode the following ASCII code: 1001010 1001111 1001000 1001110 0100000 1000100 1001111 1000101
5	Convert the following binary numbers to decimal: 101110; 1110101; and 110110100.
6	Convert the following decimal numbers to binary: 1231; 673; and 1998.
7	Convert the following decimal numbers to the bases indicated. a. 7562 to octal b. 1938 to hexadecimal c. 175 to binary
8	Convert the hexadecimal number F3A7C2 to binary and octal.
9	Obtain the 1's and 2's complements of the following eight-digit binary numbers: 10101 1 10; 10000001; 10000000; 00000001; and 00000000.
10	Obtain the 10's complement of the following six-digit decimal numbers: 123900; 090657; 100000; and 000000.
11	Obtain the 9's complement of the following eight-digit decimal numbers: 12349876; 00980100; 90009951; and 00000000.
12	Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. a. $11010 - 10000$ b. $1\ 1010 - 1101$ c. $100 - 110000$ d. $1010100 - 1010100$
13	Perform the arithmetic operations $(+42) + (-13)$ and $(-42) - (-13)$ in binary using signed-2's complement representation for negative numbers.
15	Perform the arithmetic operations $(+70) + (+80)$ and $(-70) + (-80)$ with binary numbers in signed-2's complement representation. Use eight bits to accommodate each number together with its sign. Show that overflow occurs in both cases, that the last two carries are unequal, and that there is a sign reversal.
16	Represent decimal number 8620 in (a) BCD; (b) excess-3 code; (c) 2421 code; (d) as a binary number.