JAYPEE INSTITUTE OF INFORMATION TECHNOLOGY, NOIDA
Electronics and Communication Engg.
B.Tech. IInd year
Digital Systems (18B11EC213) Even Sem
Tutorial-1

1. Convert the following binary numbers to octal and then to decimal.

i. 11011100.101010

ii. 01010011.010101

iii. 10110011

2. Convert the following numbers from decimal to octal, hexadecimal and then to binary.

i. 375

ii. 249

iii. 27.125

iv. 15.97

3. Perform the subtraction using both methods (2's complement & 1's complement method) of the following unsigned numbers.

i. $(01000)_2$-$(01001)_2$

ii. $(01100)_2$-$(00011)_2$

iii. $(48)_{10}$ –$(36)_{10}$

iv. $(36)_{10}$-$(48)_{10}$

4. Encode the following decimal numbers in BCD code and Excess-3 code.

i. 46

ii. 20.305

iii. 224.56

5. Convert the following binary numbers to Gray code.

i. 10110011

ii. 10000111

6. Simplify the following Boolean expressions.

i. AB+AB'C(B'C'+C)+A'C'

ii. A'BC'+A'BC+AB'C'+ABC

7. Express the following function in Sum of minterm and product of maxterms:

F(A,B,C,D)=B'D+A'D+BD

8. Convert the following expressions into sum of products and product of sums.

i) (AB+C)(B+C'D)

ii) x'+x(x+y')(y+z')

9. Simplify the following Boolean expressions.

i) B'D+A'BC'+AB'C+ABC' using four-variable K-map

ii) AB'C+B'C'D'+BCD+ACD'+A'B'C+A'BC'D using four-variable K-map

iii) A'B'CE'+A'B'C'D+B'D'E+B'CD'+CDE'+BDE' using five-variable K-map

10. Simplify the following Boolean functions by first finding the essential prime implicants.

i) $F(A,B,C,D)=\Sigma(0,2,3,5,7,8,10,11,14,15)$

ii) $F(A,B,C,D)=\Sigma(1,3,4,5,10,11,12,13,14,15)$