SIPNA COLLEGE OF ENGINEERING AND TECHNOLOGY, AMRAVATI
Department of Computer Science and Engineering
- **Year/Sem: 2nd/3rd**
- **Subject: A&DE**
- **Session: 2023-24**

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Question Bank

Unit-III

Q1. Convert the given hexadecimal number $(1E.53)_{16}$ into equivalent binary, octal & decimal.

Q2. Represent $(32)_{10}$ in
   a) BCD code   b) Excess-3 Code

Q3. Convert the following binary to Gray code $(11001100)_2$.

Q4. Compute using 2's complement
   $(42)_{10} - (68)_{10}$

Q5. Convert the following octal number into its equivalent hexadecimal, binary & decimal.
   a) $(0.7634)_8$ b) $(65.64)_8$

Q6. Perform following subtraction using 2's Compliments method
   a) $(2A)_{16} - (1C)_{16}$ b) $(28)_{10} - (16)_{10}$

Q7. Convert $(20)_{10}$ to Gray code

Q8. Represent the decimal number 62 in following various codes:
   i) Binary ii) BCD iii) Excess - 3 iv) Gray Code v) Octal vi) Hexadecimal

Q9. Perform following subtraction using 9's Compliments method
   a) $(28)_{10} - (16)_{10}$ b) $(34)_{10} - (29)_{10}$

Q10. Perform following subtraction using 10's Compliments method
   a) $(268)_{10} - (347)_{10}$ b) $(69)_{10} - (32)_{10}$

Q11. Convert the following numbers:
   i) $(117)_{10} = ( )_2$
   ii) $(37.31)_{10} = ( )_2$
   iii) $(3000.45)_{10} = ( )_8$
   iv) $(2003.31)_{10} = ( )_{16}$

Q12. Convert the following numbers to its decimal equivalent:
   i) $(475.25)_8 = ( )_{10}$
   ii) $(9B2.1A)_{16} = ( )_{10}$
   iii) $(3102.12)_8 = ( )_{10}$
   iv) $(614.15)_8 = ( )_{10}$

Unit-IV

Q1. Simplify the following function using k-map

$f = \sum m\ (0,1,2,3,5,7,9) + d\ (11,13,14,15)$

Q2. Simplify the following Boolean function by using k-map

$F\ (A, B, C, D) = \sum m\ (0,1,2,3,5,7,8,9) + d\ (11, 13, 14, 15)$

Q3. Simplify the following function using tabulation method

$f\ (A, B, C, D) = \pi\ M\ (0,2,4,6,8,9,12,13)$

Q4. Implement following function with NOR-NOR logic:

$f = \pi\ M\ (0,2,4,5,6)$

Q5. Implement following function with NAND-NAND logic:

$f = \sum m\ (0,2,4,5,6)$

Q6. Simplify the following three variable expression using Boolean function

$F = \sum m\ (1,3,5,7)$

Q.7 Simplify the following Boolean function by using tabulation method

$F\ (A, B, C, D) = \sum m\ (0,1,2,3,5,7,8,9,11,14)$

Q8. Simplify the following Boolean function by using tabulation method

$F\ (A, B, C, D, E) = \sum m\ (0,1,2,3,5,7,8,9,11,14,16,18,20,23,27,28,29,31)$

Q9. Simplify the following Boolean function by using K-map

$F\ (A, B, C, D, E) = \sum m\ (0,1,2,3,5,7,8,9,11,14,16,18,20,23,27,28,29,31)$

Q10. Simplify the following Boolean function by using k-map

$F\ (A, B, C, D) = \pi\ M\ (0,1,2,3,5,7,8,9) + d\ (11, 13, 14, 15)$

Q11. Prove the following: -

1. $A + \bar{A}B + \bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}\bar{C}\bar{D}E = A + B + C + D + E$
2. $(A + B)\ (A + C) = A + BC$
3. $AB + CD = (A+C)\ (A+D)\ (B+C)\ (B+D)$

Q12. Solve Using De-Morgans Theorm:

1. $Z = \overline{(A + BC)(D + EF)}$
2. $Z = \overline{A + \bar{B} + \bar{C}D}$
3. $Z = \overline{(A + \overline{BC})}\ (A\bar{B} + ABC)$

Q13. Prove the following:

a) $A \oplus B = \bar{A} \oplus \bar{B}$ b) $\overline{A \oplus B} = A \oplus \bar{B}$

c) $\overline{A + B} = A \oplus B$ d) $B \oplus (B \oplus AC) = AC$