**ABES ENGINEERING COLLEGE, GHAZIABAD**

**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**FUNDAMENTALS OF ELECTRONICS ENGINEERING [BEC-101/201]**

**ASSIGNMENT SHEET\_DIGITAL ELECTRONICS**

1. **Convert the following to the corresponding bases:**



1. (73.12)10 = ( )2
2. (110110.011)2 = ( )16
3. (231.36)10 = ( )2
4. (11011.10) 2= ( )10
5. (6FB.67)16 = ( )10
6. **Convert the following to the corresponding bases:**



1. (437)8= ( )10
2. (1110111.11011)2 = ( )8
3. (1011.10110)2 = ( )16
4. (743.15)8 = ( )2
5. (9AC.1B)16= ( )2
6. **Simplify the following logic expression using Boolean Algebra:**



1. F= (A+C) (AD+A)+AC+C
2. F= ((A.B)’ + C)’. B
3. Y =
4. Y = + D) +B (A+ CD)
5. Y =
6. **Consider the following Boolean expression:**



1. F (A, B, C) = A+B+BC, convert it into standard SOP form
2. F (A, B, C) = A.( +). (A++), convert it into standard POS form
3. F (A, B, C) = (A+). (B+C), convert it into standard POS form
4. **Simplify the expression using K-Map and implement using NAND logic gates.**



1. F(A, B, C, D, E)=∑m(0,1,2,4,5,6,10,13,14,18,21,22,24,26,29,30
2. F (A, B, C, D, E) = ∑m (0,2,5,7,8,10,16,21,23,24,27,31)
3. F (A, B, C, D) = Σ m (3,5,9,11,15) + d (2,4,6,10)
4. Y = (4,6,10,12,13,15)
5. Y = (0,1,2,3,7,8,10) + d (5,6,11,15)



1. **Simplify the expression using K-Map and implement using NOR logic gates.**



1. F (A, B, C, D, E) = Σm (1,3,4,5,6,7,9,11,13,15)
2. F (A, B, C, D, E) =
3. F (A, B, C, D) = AB’C’ +A’BC + A’B’CD +ABCD + d (1,5)
4. **Perform the following:**



1. (4433)5 = (?)10= (?)2
2. (5654)7 = (?)2
3. (292)10 = (1204)x. Find the value of x.
4. (1001.10101)2 = (?)Gray
5. (1010111.01010111)Gray = (?)2
6. **Perform the following:**



1. (101010101.1101010)2 = (?)1’s complement
2. (1101010101111.0101011)2= (?)2’s complement
3. (123.54533)6 = (?)10 = (?)2= (?)8
4. (3132.5)8 = (?)16

**9. Derive a logic expression for a four input digital system, the output of which equals to 1 only when there are odd number of ones in the input combinations. Draw the logic diagram and construct the truth table.**



**10. Simplify using K map:**



**i.** F (A,B,C,D,E,F) =

ii. F (A, B, C, D, E) = + d (24,26,30,31)

**11**. **Consider X = 1010100; Y = 1000011: Perform using 2’s complement & 1’s complement methods separately:** i. X – Y ii. Y-X



**12.Why are NAND and NOR gates called Universal Logic Gates? Implement the following using NAND and NOR gates:**



1. NOT ii. AND iii. OR iv. EXOR v. EXNOR vi. NOR

**13**. **Q15. Verify the truth table of a 3 input EXOR gate.**



**14. Design a logic circuit having three inputs X, Y and Z. The output is 1 only when Y=Z = 1.**

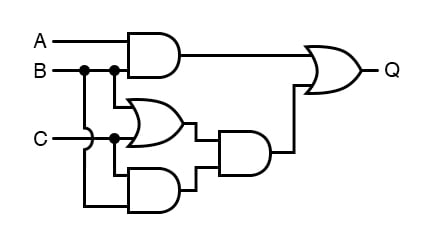


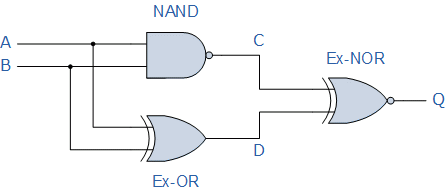
**15. Using 10’s complement & 9’s complement method, perform:**

1. 76532 – 4250 ii, 4250 – 76532

**Q16. Evaluate the output of the given circuit when A = 0, B = 0 , C= 1 and D = 1.**





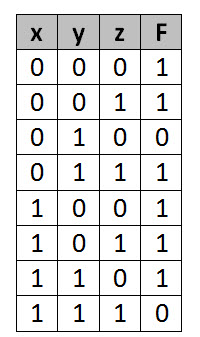




**Q17. Find the complement of F = x + yz. Show that F.F’ = 0 and F + F’ = 1.**

**Q18. Use the K-map method to implement the logic function specified in the following truth table, both in SOP as well as POS form.**





**19. Simplify the Boolean function using don’t care conditions in POS form:**



F = + BC + ABC ; d = C + B D

**20. Obtain the standard SOP and standard POS expression for the logic function whose truth table is given below:**



A table with numbers and letters

Description automatically generated

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