MANAV RACHNA
vidyanatariksha

MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICAION ENGINEERING

Subject: DIGITAL ELECTRONICS& MICROCONTROLLERS (ECH308B-T/P Branch: CSE

Course: B. Tech 5th Sem.

TUTORIAL -0 : PREREQISITES

CO2.Convert the different type of codes and number systems which are used in digital Communication and computer systems.

BT1- Knowledge

1. Convert the binary number to $(1\ 1\ 0\ 1\ 0\ 1)_2$ to decimal
2. Convert the fractional binary number 0.1011 into decimal.
3. Convert the following decimal numbers to binary:
   (a) 25 (b) 58
4. Convert the decimal number 0.625 to binary.
5. $(01000010)_2$ equivalents decimal is ----------.
6. Base or radix of a number is
   (a)The no of digits in the system
   (b) Number length of the given digit
   (c) Positional weight of numbers.
7. The number system with radix 12 is

(a) Binary (b) decimal (c) duodecimal (d) hexadecimal

MANAV RACHNA
vidyanatariksha

MANAV RACHNA UNIVERSITY
(FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION)
Declared as State Private University under section 2f of the UGC act, 1956

Faculty of Engineering
Department of Electronics and Communication Engineering
Tutorial No. - 1

Course Name: DEMC **Tutorial number:1**
Course Code: ECH308-T **Class / Semester: CSE,5th**
Max. Marks : 5

***Blooms Taxonomy Level**: BT2*

1. Convert the following binary numbers into equivalent decimal numbers, octal numbers and hexadecimal numbers.
   a) 1001101.1011
   b) 111000101
   c) 1101101.0110
2. Convert the following decimal numbers into binary, octal and hexadecimal numbers:
   a) 24.25
   b) 160.376
   c) 1532.275
3. Convert the following octal numbers into decimal, binary and hexadecimal numbers:
   d) 24
   e) 160.07
   f) 1502.612
4. Convert the following hexadecimal numbers into decimal ,binary and octal numbers:
   a) 8A3.B4
   b) 268.CF
   c) FD86

HOD-ECE Course Co-ordinator

MANAV RACHNA
vidyanatariksha

MANAV RACHNA UNIVERSITY
(FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION)
Declared as State Private University under section 2f of the UGC act, 1956

Faculty of Engineering
Department of Electronics and Communication Engineering
Tutorial No. - 2

Course Name: DEMC **Tutorial number:2**
Course Code: ECH308-T **Class / Semester: CSE,5th**
Max. Marks : 5

CO1: A thorough understanding of the fundamental concepts and techniques used in Digital Electronics and Microcontrollers.

CO2.Convert the different type of codes and number systems which are used in digital communication and computer systems.

Blooms Taxonomy Level*: BT1, BT3*

1. Express the following in signed binary system :
   a) +8
   b) -8
   c) 165
   d) -165

2. Find the 2's complement of the following:
   a) 0001 1111
   b) 1110 0101
   c) 1111 0111

3. Express the numbers -127 and -100 in 8-bits
   a) Sign magnitude
   b) 1's complement
   c) 2's complement

4. Express the following decimal numbers in 8421 BCD code:
   a) 90
   b) 115
   c) 410

5. Perform BCD addition
   (1) 589 + 199 (2) 175 + 326

HOD-ECE Course Co-ordinator

MANAV RACHNA
vidyanatariksha
MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICAION ENGINEERING

Subject: DIGITAL ELECTRONICS& MICROCONTROLLERS (ECH308B-T/P)

Branch: CSE

Course: B.Tech 5th SEM

TUTORIAL -3: Duality, SOP and POS

CO1: A thorough understanding of the fundamental concepts and techniques used in Digital Electronics and Microcontrollers.

CO2.Convert the different type of codes and number systems which are used in digital communication and computer systems.

Blooms Taxonomy Level*: BT2, BT3*

1. Construct truth table for the given min terms (m_3+m_6)
2. The function of Boolean variables X, Y and Z is expressed in terms of the min-terms as F(X, Y, Z) = ∑m(1, 2, 5, 6, 7). Find the product of sums expression.
3. Simplify f=(B+BC) (B+B$\overline{C}$) (B+D)
4. Show that AB+A$\bar{B}$C+B$\bar{C}$=AC+B$\bar{C}$
5. Minimize the Boolean function
   f(A,B)=∑ m(0,2,3)

MANAV RACHNA
vidyanatariksha

MANAV RACHNA UNIVERSITY
(FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION)

Declared as State Private University under section 2f of the UGC act, 1956

Faculty of Engineering
Department of Electronics and Communication Engineering
Tutorial No. - 4

Course Name: DEMC **Tutorial number:4**
Course Code: **Class / Semester: CSE**
Max. Marks : 10 **Time Allowed: 1 week**

CO1. Understand and apply the fundamental concepts, techniques and applications of Number Systems and Codes used in digital electronics.

Blooms Taxonomy Level*: BT3, BT4*

1. Simplify using K-Map f(A,B,C,D,E) = Σ(0,1,2,3,8,12,15,16,17,18,19,22,28,31)
2. Simplify using K-map f(A,B,C,D,E) = Σ(1,2,3,8,9,10,15,16,17,18,22,26,27) + d (0,4,11,19,28,29,30,31)
3. Minimize & implement in SOP f(A,B,C,D) = Σm (1,2,3,6,8,12,14,15)
4. Draw truth tables for the following:
   a) Y = A(B + C) + A
   b) Y = A + B + AB
   c) Y = AB + A(B+C) + A +AC

HOD-ECE Course Co-ordinator

MANAV RACHNA
vidyanatariksha
MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICAION ENGINEERING

Subject: DIGITAL ELECTRONICS& MICROCONTROLLERS (ECH308B-T/P)

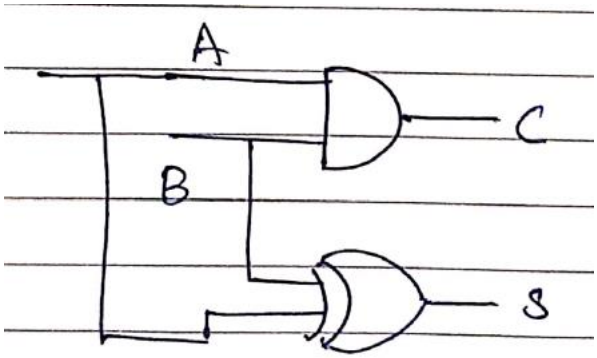
Branch: CSE

Course: B.Tech 5th SEM

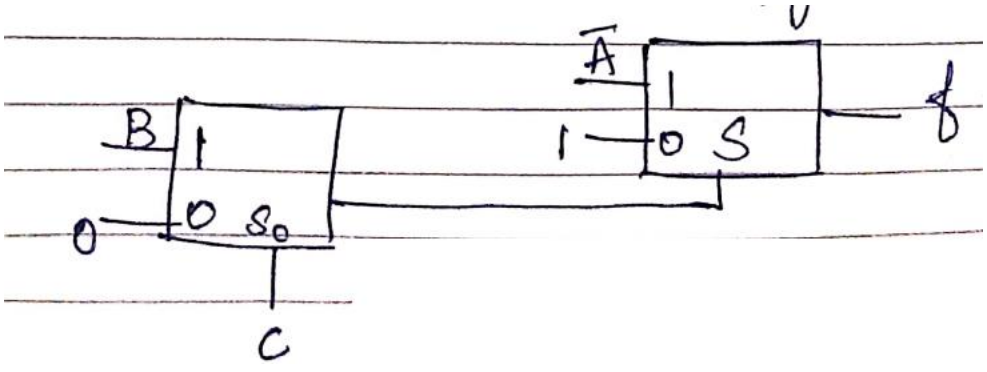
TUTORIAL -5: Combinational Circuit

CO3. Analyze different types of digital electronic circuits using various mapping and logical tools and know the techniques to prepare the most simplified circuit using multiple mapping and mathematical methods.

1. If AB=00 and AB=01 what is the value for C and S?



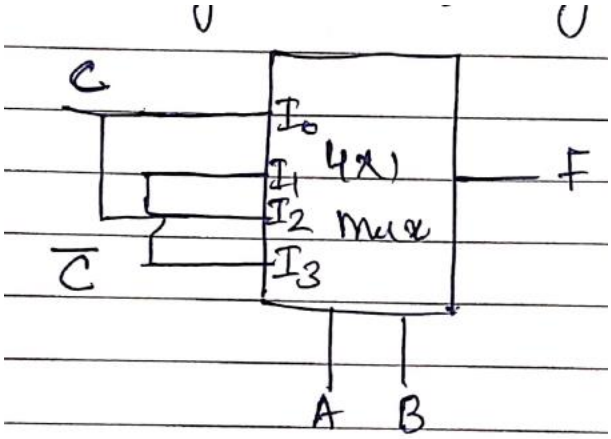
2. The network shown in the figure implements----------gate



3. Implement the Boolean function using 4x1 Mux

   F(A, B, C, D)=Σ(0,1,4,6,7,9,11,15)

4. The logic realized by the circuit is



5. How many 8x1 Mux are required to get 64x1 Mux

MANAV RACHNA
vidyanatariksha
MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICAION ENGINEERING

Subject: DIGITAL ELECTRONICS& MICROCONTROLLERS (ECH308B-T/P)

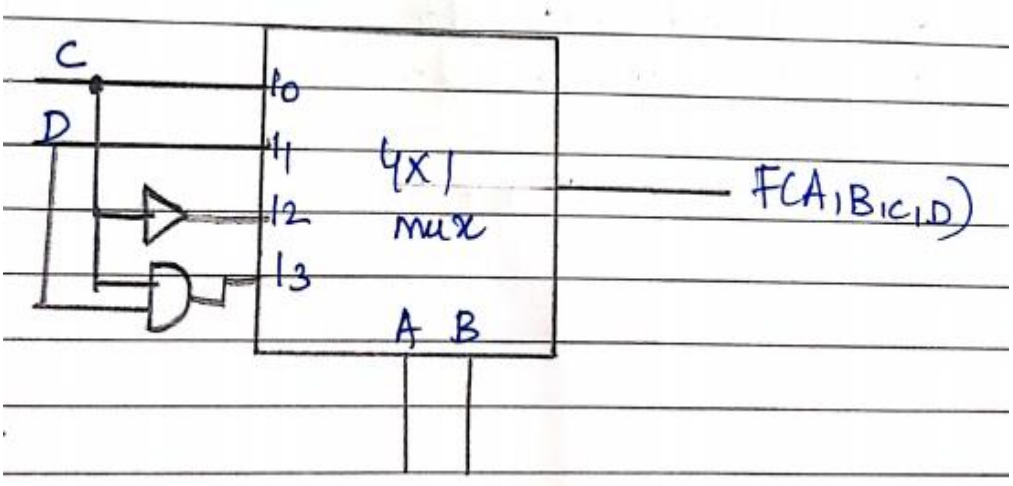
Branch: CSE

Course: B.Tech 5th SEM

TUTORIAL -6: Combinational Circuits

CO3. Analyze different types of digital electronic circuits using various mapping and logical tools and know the techniques to prepare the most simplified circuit using multiple mapping and mathematical methods.

1. Implement Full Subtractor using 4*1 MUX.
2. The Boolean function realized by the logic circuit shown is



3. Implement the full adder by using 1:8 Demultiplexer?

MANAV RACHNA
vidyanatariksha
MANAV RACHNA UNIVERSITY
FORMERLY MANAV RACHNA COLLEGE OF ENGINEERING
NAAC ACCREDITED 'A' GRADE INSTITUTION
Declared as State Private University under section 2f of the UGC act, 1956

DEPARTMENT OF ELECTRONICS AND COMMUNICAION ENGINEERING

Subject: DIGITAL ELECTRONICS& MICROCONTROLLERS (ECH308B-T/P)

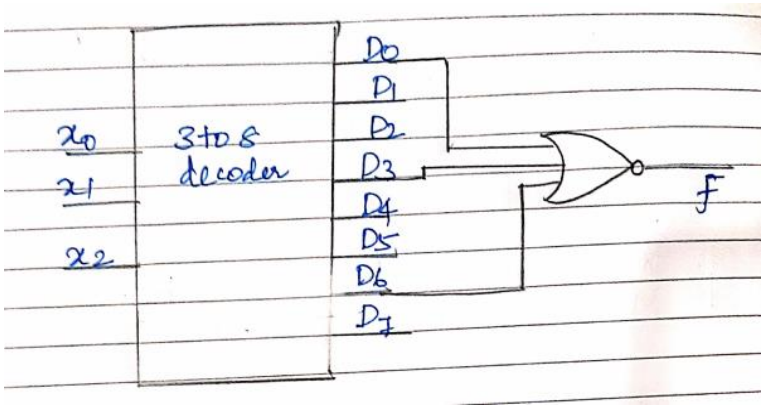
Branch: CSE

Course: B.Tech 5th SEM

TUTORIAL - 7: DECODER AND MUX

CO3. Analyze different types of digital electronic circuits using various mapping and logical tools and know the techniques to prepare the most simplified circuit using multiple mapping and mathematical methods.

1. Find the value of $f(x_2, x_1, x_0)$



2. Design a BCD to seven segment decoder.
3. Design a 4 bit Gray code to Binary code converter.