

S.No. 017772

# RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY AUTONOMOUS



Accredited by NAAC of UGC, New Delhi with 'A' Grade:: Accredited by NBA

Affiliated to JNT University Anantapur

Nandyal - 518 501, Kurnool Dist, A.P.

## INTERNAL EXAMINATIONS ANSWER BOOKLET

 NAME OF THE STUDENT: Abdul Rouhid Reg. No. 

2	2	0	9	1	A	0	4	0	1
---	---	---	---	---	---	---	---	---	---

	1	2	3	4	5
A		2	1/2		
B		2	1		0
C	0	0			
D	0				
E	0				
Total	0	4	2 1/2	1/2	0
<b>Grand Total :(In Figures)</b>					11
(in Words):					one One

NAME OF THE SUBJECT: Digital Logic Circuit design.INTERNAL EXAM :  / IIDate of Exam: 01/11/2023 (FN/AN) Course :  B.Tech. / M.Tech. / MBA / MCAYear : II Sem.: IBranch: ECE
  
Signature of the Invigilator

(Start Writing From Here)

- 2.a) Binary Codes: Binary Codes are the Codes which consist of only two symbols '0' and '1'. The specific combination of these "0's and 1's" represent a specific number.
- \* A Computer (or) Any hardware Only read 0's and 1's
  - \* 0 - if switch is ~~closed~~ <sup>open</sup> and 1 if switch is ~~open~~ <sup>closed</sup>
  - \* As Computers only read 1's and 0's it is very easy to use binary code in hardware.
  - \* The binary code consist of weights.
  - \* If the bit is 1's add repeated weight or consider as 0.

Ex: Consider weight 8 4 2 1

	8	4	2	1	
for 0	B.C	0	0	0	0
1	B.C	0	0	0	1
2	BC	0	0	1	0
3	BC	0	0	1	1
4	BC	0	1	0	0
5	BC	0	1	0	1
6	BC	0	1	1	0
7	BC	0	1	1	1
8	BC	1	0	0	0
9	BC	1	0	0	1

→ Binary Code for 1

→ Binary Code for 9

\* Most electronics are coded in Binary Codes.

2. b)

Decimal digit	Excess-3	Binary
0	0001	0000
1	0100	0001
2	0101	0010
3	0110	0011
4	0111	0100
5	1000	0101
6	1001	0110
7	1010	0111
8	1011	1000
9	1100	1001



$$F = \bar{A}\bar{B} + \bar{C}\bar{D} + A\bar{B}\bar{C}$$

$$\bar{F} = \overline{\bar{A}\bar{B} + \bar{C}\bar{D} + A\bar{B}\bar{C}}$$

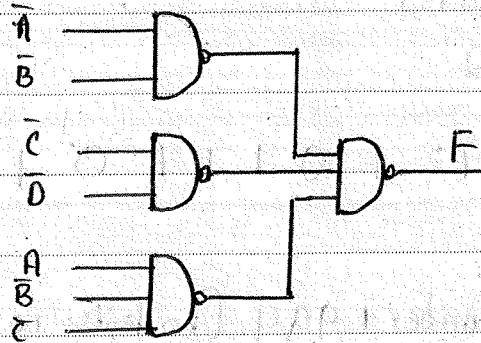
$$F = (\bar{B} + \bar{D})(\bar{B} + \bar{C})(\bar{A} + \bar{C})$$

$$\bar{F} = \overline{\bar{B} + \bar{D}} + \overline{\bar{B} + \bar{C}} + \overline{\bar{A} + \bar{C}}$$

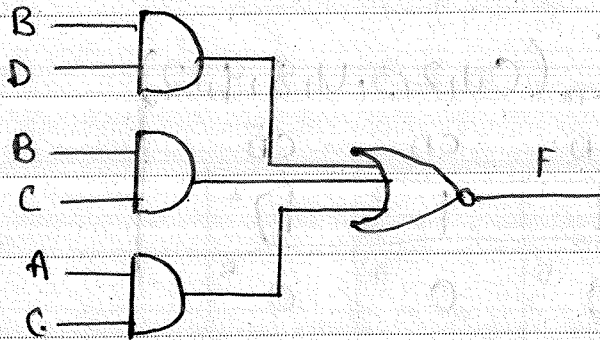
$$= (B \cdot D) + (B \cdot C) + (A \cdot C)$$

$$= (\overline{B \cdot D}) \cdot \overline{B \cdot C} \cdot \overline{A \cdot C}$$

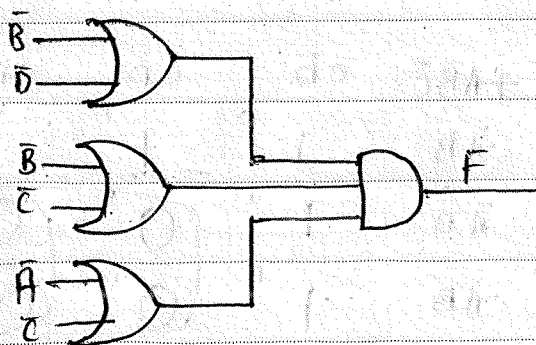
(i) NAND-NAND.



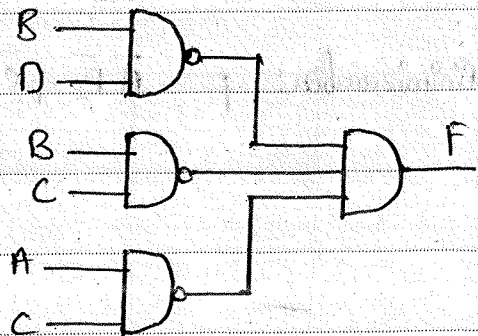
(ii) AND-NOR.



(iii) OR-AND.



(iv) NOR-OR.

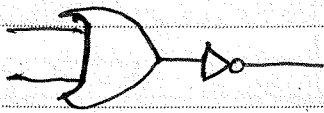


Handwritten signature or initials.

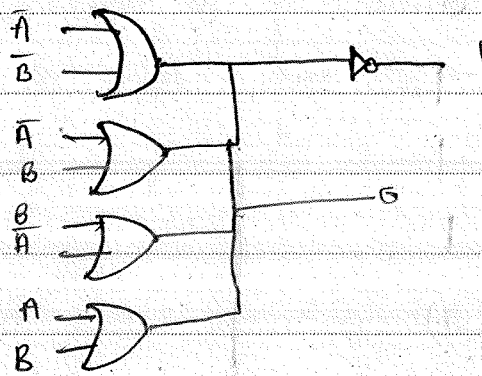
1.d)

A	B	AND	OR	NAND
0	0	0	0	1
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0

(i) AND using NAND



ii) OR using NAND



1.c) i)  $(AB0)_{16} = (X)_8$   
 $(16\ 17\ 18)_{10} = (X)_{18}$   
 $16 \times 8^2 + 17 \times 8^1 + 18 \times 8^0 = X \times 8^0$   
 $1178 = X$

ii)  $(X)_{16} = (425)_8$   
 $X \times 16^0 = 4 \times 8^2 + 2 \times 8^1 + 5 \times 8^0$   
 $X = 340$

1.e)  $(18)_{10} = (200)_B$   
 $1 \times 10^2 + 8 \times 10^0 = 2 \times B^2$   
 $B = 18 //$

3. b)

$8 \times 1$

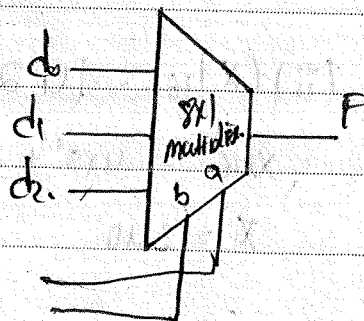
$2^3 \times 1$

so 3 inputs, 1 output, 3 ~~lines~~ <sup>junctions</sup> lines.

Truth table.

D	Input			Output
	$d_2$	$d_1$	$d_0$	
0	0	0	0	0
1	0	0	1	0
2	0	1	0	0
3	0	1	1	1
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	1

$$F = \sum m(3, 5, 6, 7)$$



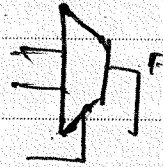
3.a) Multiplexer :- Multi plexer is a Combinational Circuit which have  $2 \times 1, 4 \times 1, 8 \times 1 \dots$  Configurations.

ie,  $2^n \times 1$  It contain Only one Output.

it has  $n$  inputs

and  $n$  number of transmission lines.

\* It is represented by Symbol



\* Very Easy when we have  $n$  input and have to generate Only one Output.

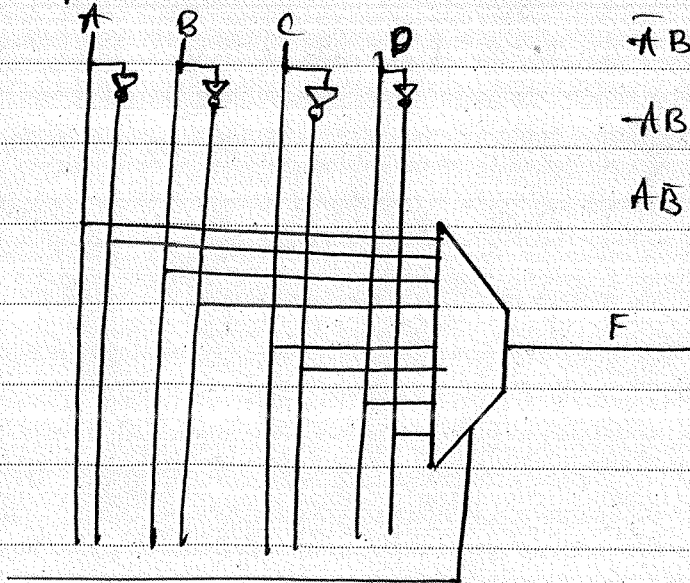
\* Minimization of a Multiplexer is very simple.

\* It is widely used in telecommunication.

\* Due to presence of transmission lines no error & delay occur.

5.b)  $F(A,B,C,D) = \sum m(0, 2, 3, 6, 9, 11, 13, 15)$

$F = A\bar{0} + \bar{A}\bar{B}C + \bar{C}DB + CD\bar{A}$



- $\bar{A}\bar{B}$
- $\bar{A}B$
- $\bar{A}B$
- $A\bar{B}$

$\bar{C}\bar{D}$	$\bar{C}D$	$C\bar{D}$	$CD$
1 <sup>0</sup>	0 <sup>1</sup>	1 <sup>3</sup>	1 <sup>2</sup>
0 <sup>4</sup>	0 <sup>5</sup>	0 <sup>7</sup>	1 <sup>6</sup>
0 <sup>12</sup>	1 <sup>13</sup>	1 <sup>15</sup>	0 <sup>14</sup>
1 <sup>8</sup>	1 <sup>9</sup>	1 <sup>11</sup>	0 <sup>10</sup>