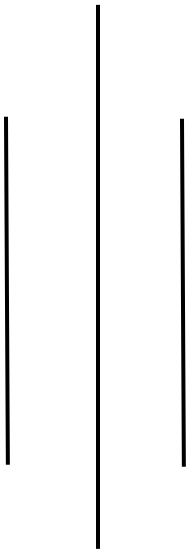

SHAID SMARAK COLLEGE

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Assignment no: - 5 of Digital logics

Submitted by :-

1st semester

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Assignment - 5

construction of ROM

x) Design a combinational circuit using a ROM. The circuit accepts a 3-bit number & generates an output binary number equal to the square of the input number.

x	y	z	F_1	F_2	F_3	F_4	F_5	F_6
0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	1
0	1	0	0	0	0	1	0	0
0	1	1	0	0	1	0	0	1
1	0	0	0	1	0	0	0	0
1	0	1	0	1	1	0	0	1
1	1	0	1	0	0	1	0	0
1	1	1	1	0	0	0	0	1

↳ Here, in the above truth table the combinational circuit has 3 inputs & 6 outputs

So, the boolean function is:-

no of inputs (n) = 3

no of outputs (m) = 6

we know, that decoder is 2^n

So, $2^n = 2^3 = 8$

∴ 8 to 8 decoder.

Boolean Function

$F_1 = \Sigma(6,7)$

$F_2 = \Sigma(4,5,6)$

$F_3 = \Sigma(3,5)$

$F_4 = \Sigma(2,6)$

Now, we construct a 8 x 6 ROM with the help of 8 to 8 decoder.