1. How many inputs does a decoder have if it has 64 outputs?

Ans

n input = 2^n output

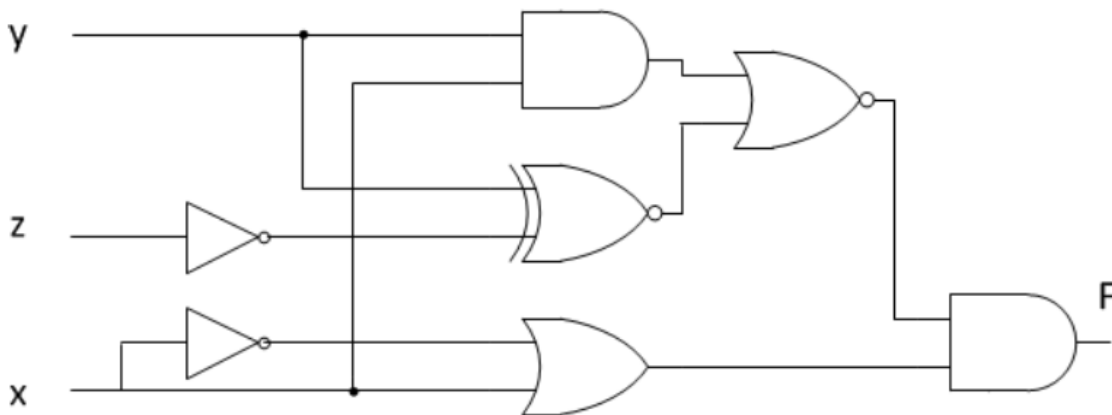64 outputs = 2^6 = 6 inputs

2. How many control lines does a multiplexer have if it has 32 inputs?

Ans

$\text{Log}_2 32$ = 5 control lines

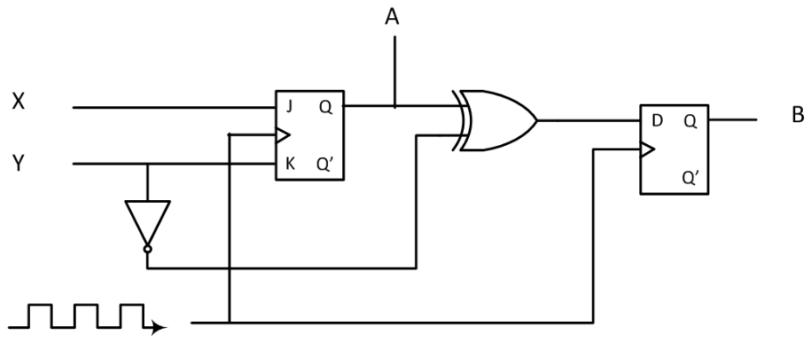3. Find the truth table that describes the following circuit:

Ans

y	z	x	$\bar{z}$	$\bar{x}$	xy	$y \oplus \bar{z}$	$\bar{x} + x$	$\overline{xy + (y \oplus \bar{z})}$	$(\bar{x} + x)\,\overline{(xy + (y \oplus \bar{z}))}$
0	0	0	1	1	0	0	1	1	1
0	0	1	1	0	0	0	1	1	1
0	1	0	0	1	0	1	1	0	0
0	1	1	0	0	0	1	1	0	0
1	0	0	1	1	0	1	1	0	0
1	0	1	1	0	1	1	1	0	0
1	1	0	0	1	0	0	1	1	1
1	1	1	0	0	1	0	1	0	0

4. Complete the truth table for the following sequential circuit:

5. 59. A Mux-Not flip-flop (MN flip-flop) behaves as follows: If M = 1, the flip-flop complements the current state. If M = 0, the next state of the flip-flop is equal to the value of N.

1. a) Derive the characteristic table for the flip-flop.
2. b) ShowhowaJKflip-flopcanbeconvertedtoaMNflip-flopbyaddinggate(s)and inverter(s).