Draw the circuit of N-bit Counter that adds 1 at each clock edge. The counter has reset and clock inputs. Upon reset, the counter output is all 0.

OR Draw the circuit of 4bit left shifter using multiplexers.

Note: Don't draw the symbol of the circuits.

[6 marks]

For the sequence A=00001111, write your answers for the following:

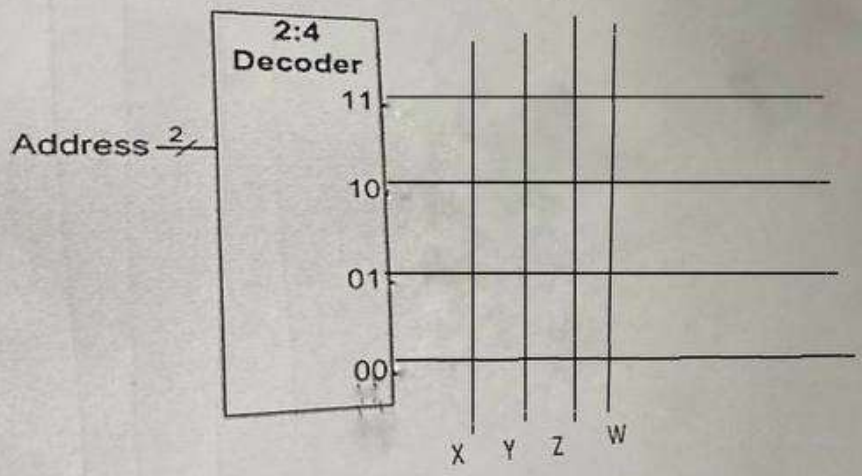
Consider shift amount = 3
and rotate amount = 4

Question	Answer.
Logical shift left (A) =	
Logical shift right (A) =	
Arithmetic shift right (A) =	
Rotate right (A) =	

Question 3 [6 marks]

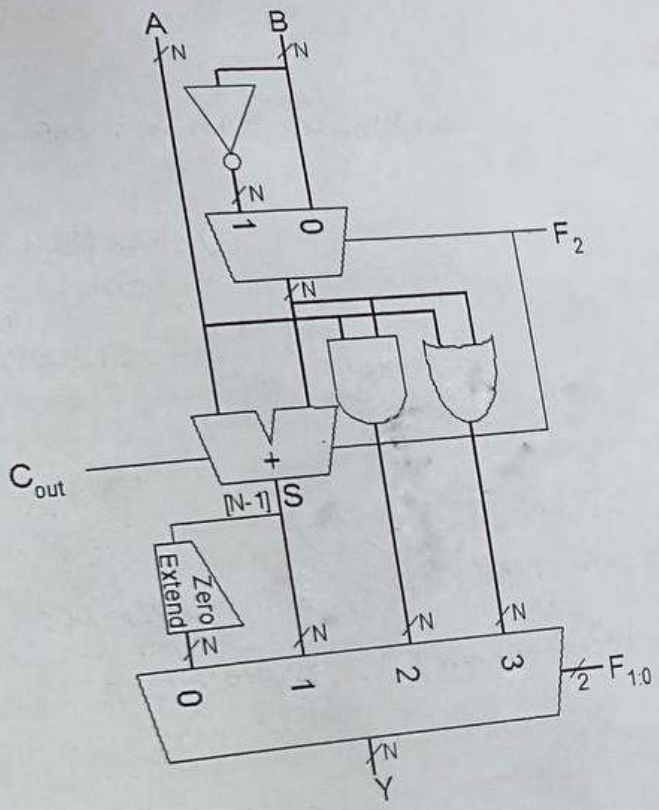
Use the dot notation and the shown ROM to represent the following functions [2 Mark]

$W = \overline{(A \oplus B)}$ $X = \bar{B}$ $Y = A + B$ $Z = \overline{(A.B)}$



Question 4 [6 marks]

For the shown ALU, complete the values of $\mathbf{F}_{2:0}$ in the following table



$F_{2:0}$	Function
	not used
	A + B
	A | B
	A | ~B
	A & ~B
	SLT
	A & B
	A - B

Question 5 [6 marks]

a) Compare between dynamic RAM and static RAM

b) Why the ROM is needed in computer system?

Question 6 [6 marks]

Choose the correct answers

The response time of 12 bit prefix adder the response time of 16 bit prefix adder =, ≤, >

2. The adder has the best performance while the adder has the worst performance. (ripple / CLA / prefix)

3. The number of address lines of the memory depends on (Memory depth, Memory none of them)

4. The maximum shift for 4 bit shifter is ..... (3/4/5/None of them)

5. $t_{PA} = t_{pg} + \log_2 N(t_{pg_prefix}) + t_{XOR}$ is equation of (ripple /CLA / prefix/None o adder