



Attempt All Questions

Question One

- a) Convert $(010111.01011)_{BCD}$ to Binary, Octal and HEX.
- b) Implement the following logic function using only NAND gates:

$$F(A, B, C) = [A \oplus (\overline{B \oplus C})]$$

Question Two

A logic circuit receives 5 bits BCD code and outputs the equivalent binary code.

- a) Develop the truth table to implement the circuit.
- b) Draw the circuit diagram using decoders and logic gates
- c) Compute the ROM size required to implement the above circuit

Question Three

A Logic circuit has two input codes A, B and an output code F. Each code consists of 4 bits. The circuit has two control inputs x and y to implement the following operations:

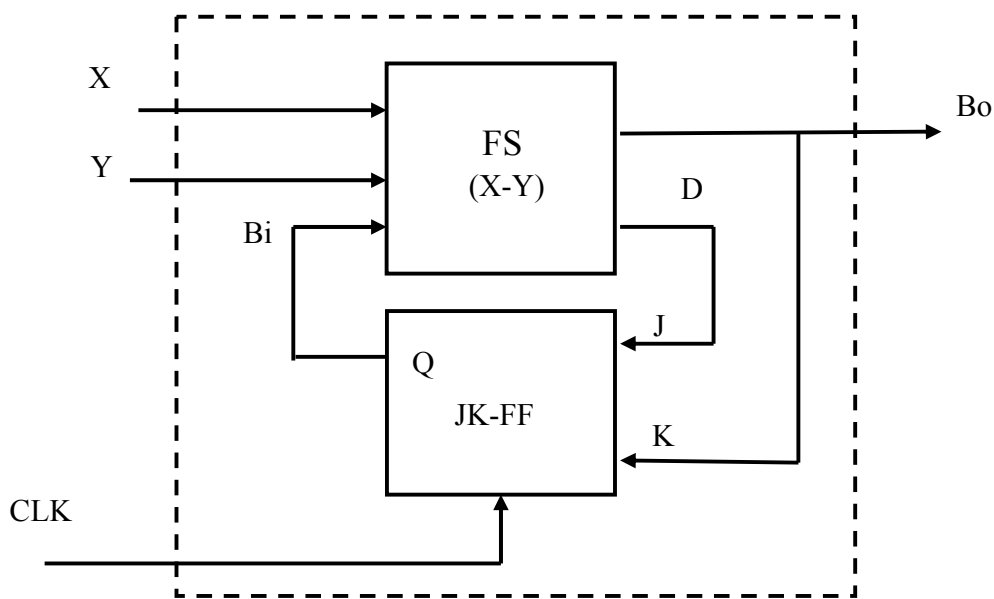
Control Inputs		Operation	
X	Y		
0	0	A+B	addition
0	1	A-B	subtraction
1	0	A+1	increment
1	1	A-1	decrement

Design the circuit using 4 bits parallel adder chip

Question Four

A sequential circuit consists of a one JK- Flip flop and Full subtractor (FS) with two inputs X and Y. The circuit has one output B_0 as shown in the block diagram below.

- Construct the truth table for the full subtractor.
- Derive the state table and state diagram.
- Derive the minimized state equation for Q^+ .



Question Five:

A digital system has a clock generator that produces pulses at a frequency of 1 KHz. Design a counter circuit that provides a clock with a cycle time of 0.05 second.