

Q1. A system is designed to operate on Gray code. It has four input terminals A (MSB), B, C, D (LSB). The system detects if any input is in the range of 5 through 12. Find the simplified Boolean expression $f(A,B,C,D)$ of the system.

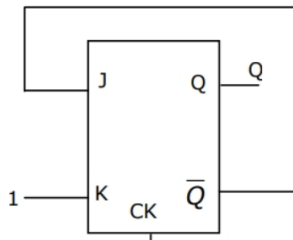
Q2. How many bits are required to represent one character in ASCII and EBCDIC code? Write the full form of these codes.

Q3. An even-parity checker indicates a parity error for which of the following received data and parity bit?

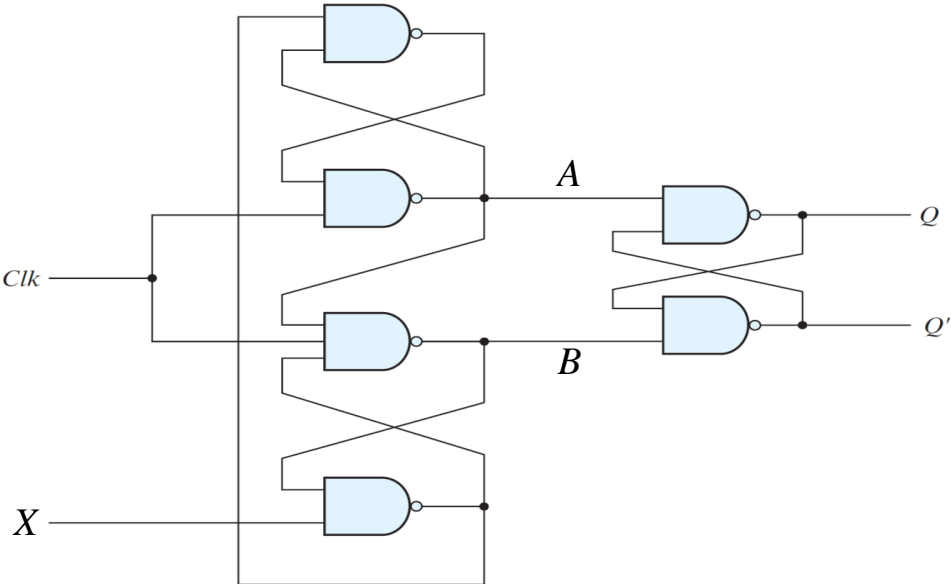
- i. Data = 1111111 Parity = 1
- ii. Data = 1001001 Parity = 0
- iii. Data = 1110000 Parity = 1
- iv. Data = 0000000 Parity = 1
- v. Data = 1100111 Parity = 1
- vi. Data = 1111110 Parity = 0

Q4. Design a 3-bit magnitude comparator using basic logic gates with three outputs $(A=B)$, $(A>B)$ and $(A<B)$.

Q5. In a J-k flip flop, we have $J=Q'$ and $K=1$. Assuming the flip flop was initially cleared and then clocked for 6 pulses, the sequence at the Q output will be?



Q6. In the given circuit, consider A and B to be kept at logic state 1 when $clk=0$. What is the logic state at A and at output Q when clk goes from 0 to 1 and $X=0$? What about logic state at B and output Q when $X=1$ and clk goes from 0 to 1?



Q7. Complete the timing diagram of the given latch by showing the waveforms of Q and N assuming that Q is initially low

