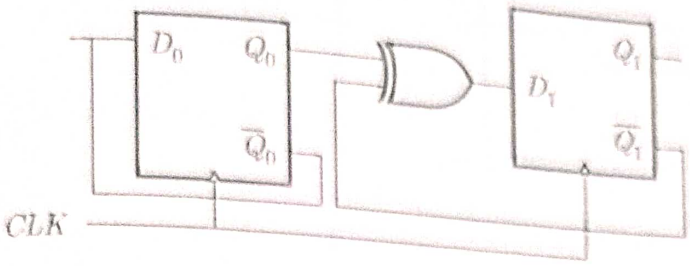
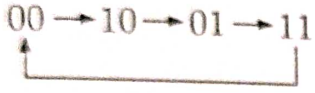
MCQ 5.1.19 Consider the following circuit

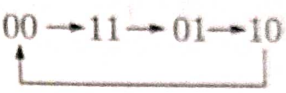


The flip-flops are positive edge triggered D-FFs. Each state is designated as a two bit string $Q_1 Q_0$. Let the initial state be 00. The state transition sequence is

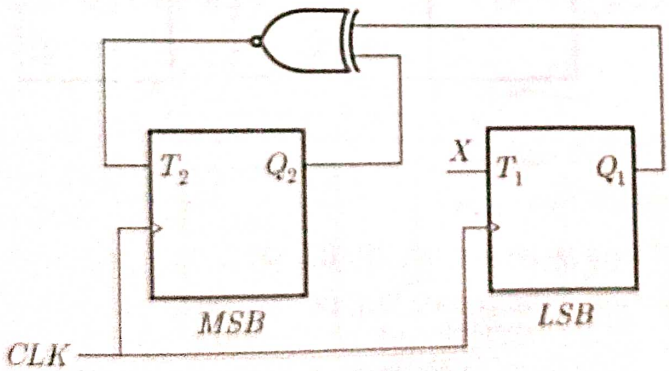
(A) 

(B) 

(C) 

(D) 

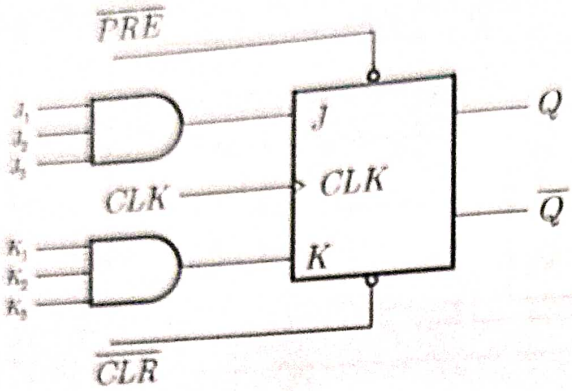
MCQ 5.1.20 Consider the partial implementation of a 2-bit counter using T flip-flop following the sequence 0-2-3-1-0 as shown below.



To complete
(A) $\overline{Q_2}$
(B) $Q_2 + Q_1$
(C) $\overline{(Q_1 \oplus Q_2)}$
(D) $Q_1 \oplus Q_2$

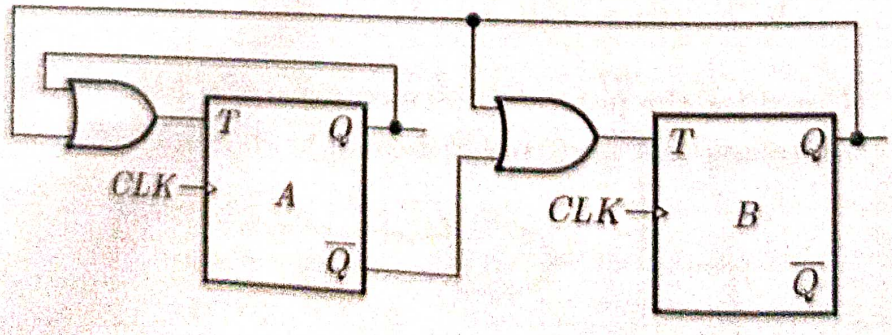
MCQ 5.1.21 The following serial data are applied to the flip-flop through the AND gates as shown in figure.

J_1 : 1010011, J_2 : 0111010, J_3 : 1111000
K_1 : 0001110, K_2 : 1101100, K_3 : 1010101



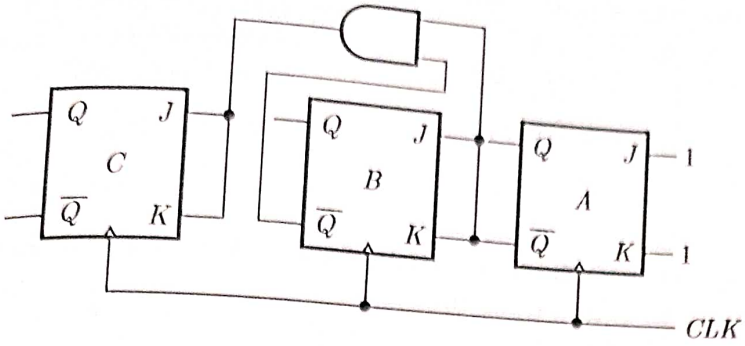
There is one clock pulse for each bit time. Q is initially 0 and $\overline{PRE}$ and $\overline{CLR}$ are high. If leftmost bits are applied first then output Q is
(A) 0000111
(B) 0011000
(C) 0101000
(D) 1010101

MCQ 5.1.22 The circuit shown in figure below is



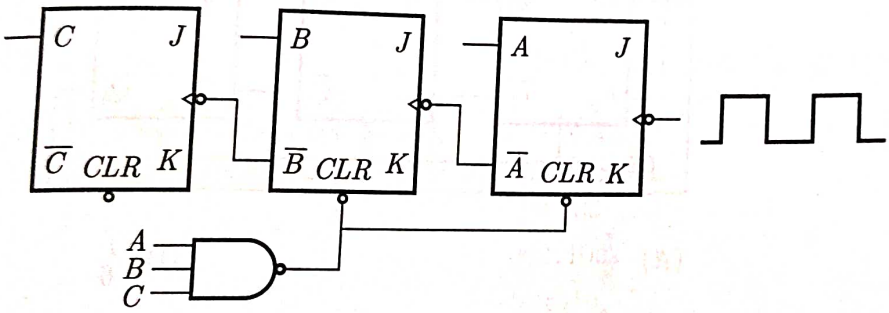
(A) a MOD-2 counter
(B) a MOD-3 counter
(C) generate sequence 00, 10, 01, 00 ...
(D) generate sequence 00, 10, 00, 10, 00 ...

MCQ 5.1.23 The counter shown in figure below is a



(A) MOD-8 up counter
(B) MOD-8 down counter
(C) MOD-6 up counter
(D) MOD-6 down counter

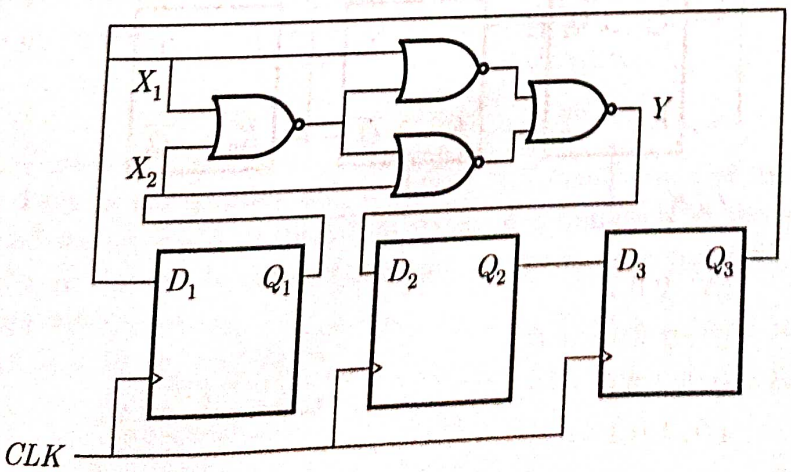
MCQ 5.1.24 The counter shown in figure below counts from



(A) 0 0 0 to 1 1 1
(B) 1 1 1 to 0 0 0
(C) 1 0 0 to 0 0 0
(D) 0 0 0 to 1 0 0

Common Data For Q. 25 and 26 :

Consider the circuit shown in following figure.



MCQ 5.1.25 The correct input output relationship between Y and (X_1, X_2) is

(A) $Y = X_1 + X_2$

(B) $Y = X_1 X_2$

(C) $Y = X_1 \oplus X_2$

(D) $Y = \overline{X_1 \oplus X_2}$

MCQ 5.1.26 The D flip-flop are initialized to $Q_1 Q_2 Q_3 = 000$. After 1 clock cycle, $Q_1 Q_2 Q_3$ is equal to

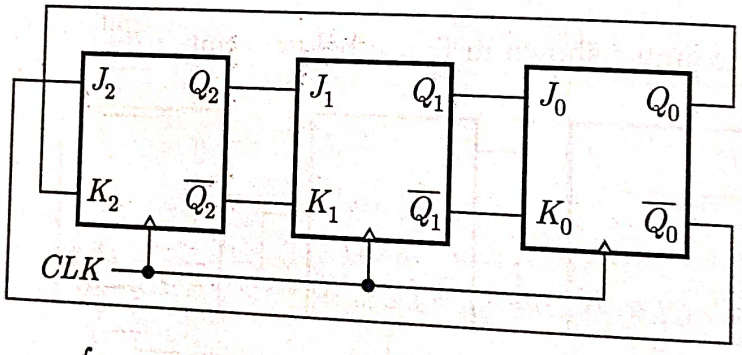
(A) 011

(B) 010

(C) 100

(D) 101

MCQ 5.1.27 The three-stage Johnson counter as shown in figure below is clocked at a constant frequency of f_c from the starting state of $Q_2 Q_1 Q_0 = 101$. The frequency of output $Q_2 Q_1 Q_0$ will be



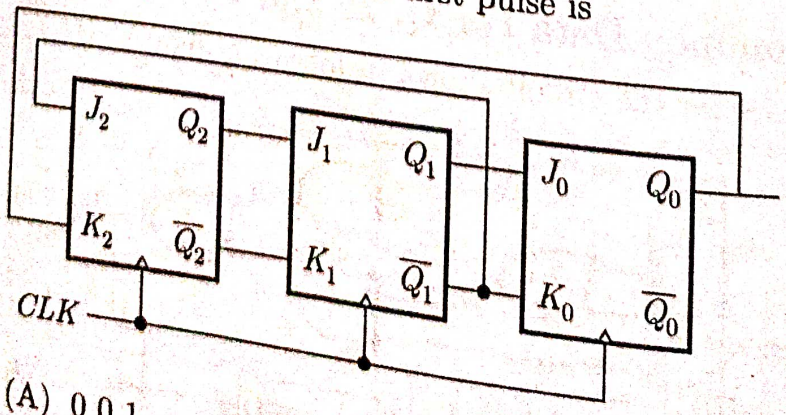
(A) $\frac{f_c}{8}$

(B) $\frac{f_c}{6}$

(C) $\frac{f_c}{3}$

(D) $\frac{f_c}{2}$

MCQ 5.1.28 The counter shown in the figure below has initially $Q_2 Q_1 Q_0 = 000$. The status of $Q_2 Q_1 Q_0$ after the first pulse is



(A) 0 0 1

(B) 0 1 0

(C) 1 0 0