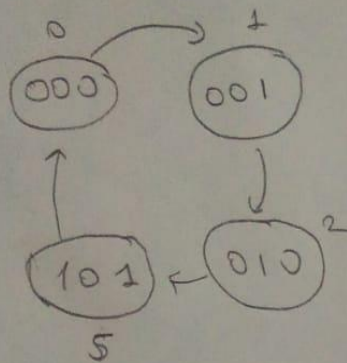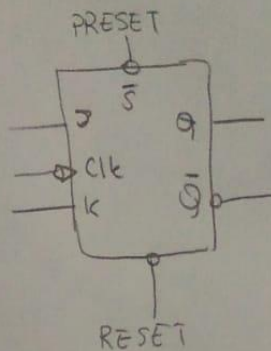2019SI0025 ⇒ Mod 8 produces 2,0,1,1,5,1,0,0,2,5 and

without repetition it counts 0,1,2,5

a) state Diagram

We have to use 3 fk flip flop.

PRESET

Q_n	Q_{n+1}	J	K
0	0	0	X
0	1	1	X
1	0	X	1
1	1	X	0

RESET

b) state table

Present state			Next state								
Q_C	Q_B	Q_A	Q_C^+	Q_B^+	Q_A^+	J_C	K_C	J_B	K_B	J_A	K_A
0	0	0	0	0	1	0	X	0	X	1	X
0	0	1	0	1	0	0	X	1	X	X	1
0	1	0	1	0	1	1	X	X	1	1	X
0	1	1	X	X	X	X	X	X	X	X	X
1	0	0	X	X	X	X	X	X	X	X	X
1	0	1	0	0	0	X	1	0	X	X	1
1	1	0	X	X	X	X	X	X	X	X	X
1	1	1	X	X	X	X	X	X	X	X	X

C) Karnough Map

for Jc

QB QA
Qc   00 01 11 10
0 | | | X | 1 |
1 | X | X | X | X |

$J_c = Q_B$

for JB

QD QA
Qc   00 01 11 10
0 | | 1 | X | 1 |
1 | X | | X | X |

$J_B = Q_A \overline{Q_c}$

for JA

QD QA
Qc   00 01 11 10
0 | 1 | X | X | 1 |
1 | X | X | X | X |

$J_A = 1$

for Kc

QD QA
Qc   00 01 11 10
0 | X | X | X | X |
1 | X | 1 | X | X |

$K_c = 1$

for KB

QD QA
Qc   00 01 11 10
0 | X | X | X | 1 |
1 | X | X | X | X |

$K_B = 1$

for KA

QD QA
Qc   00 01 11 10
0 | X | 1 | X | X |
1 | X | 1 | X | X |
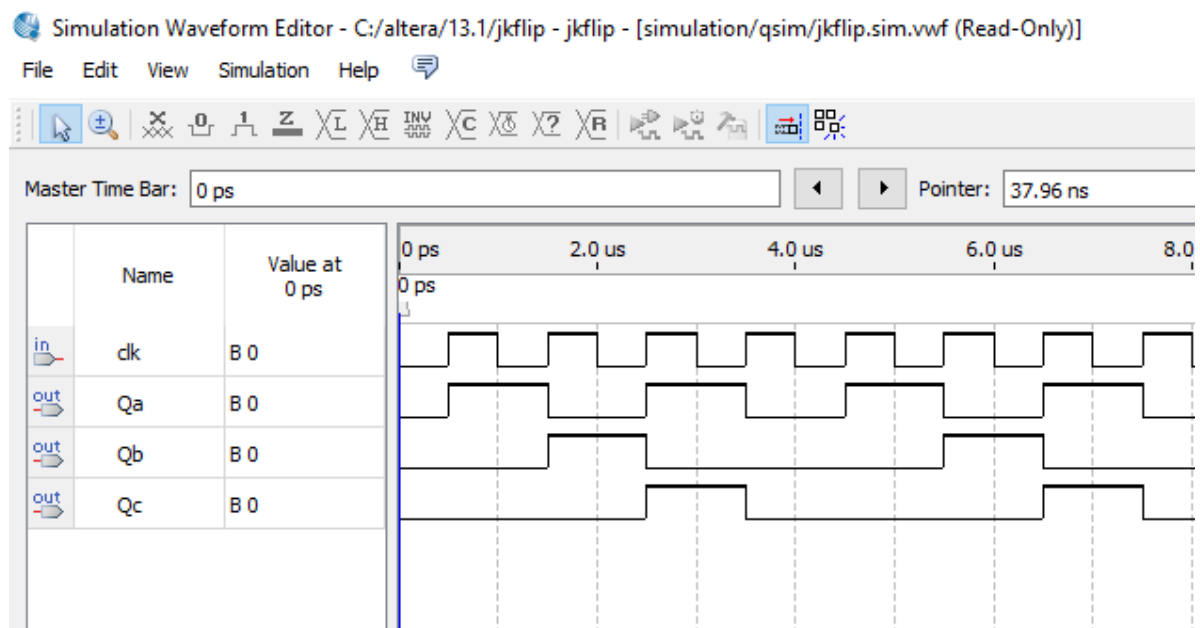
$K_A = 1$

D)Quartus
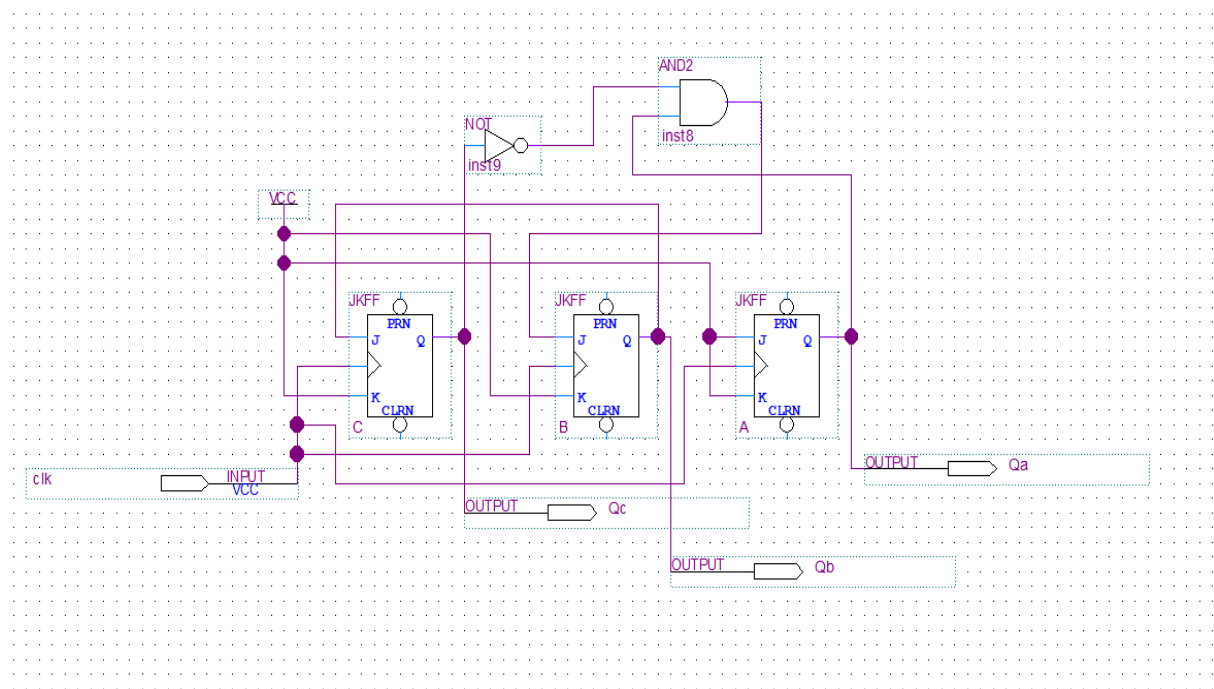
E)Waveform
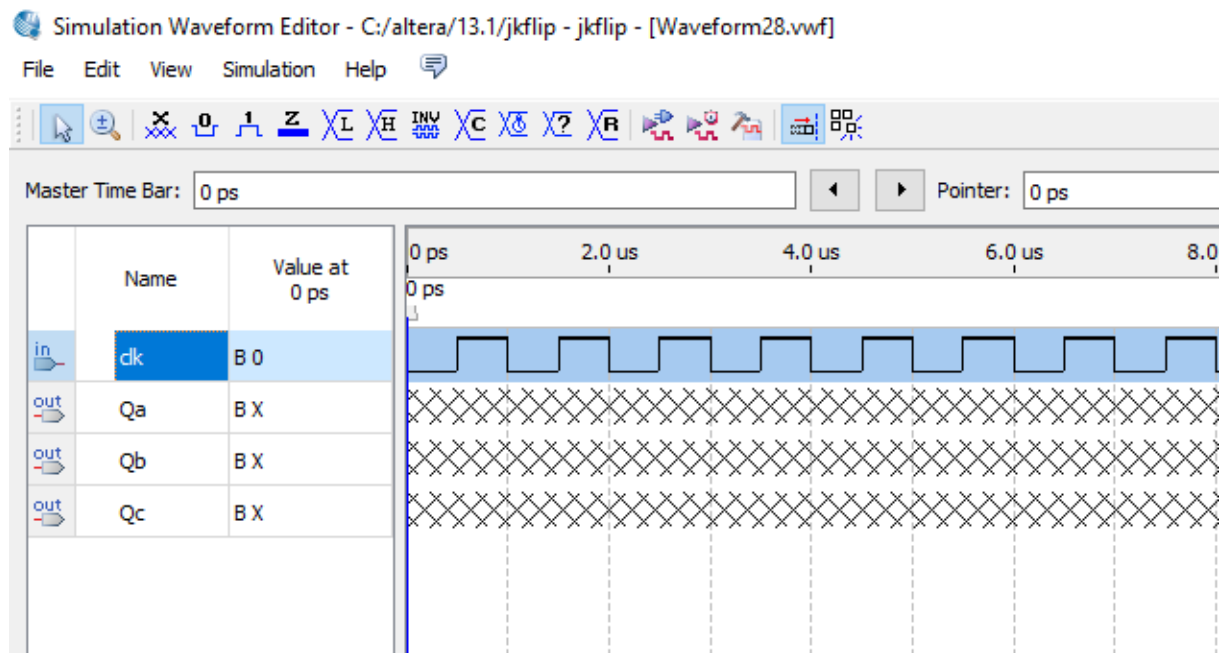
F)Waveform Result

The result of the waveform continues 0,1,2,5 without stopping.(respectively)

G)Breadboard