ASSIGNMENT N

Objective :- Conversion of flip flops.

Problem statement :- Design and Realization of flip flop conversion.

1. Conversion of JK flip flop to D flip flop.
2. Conversion of JK flip-flop to T flip flop.

Hardware & Software Requirements :-

Digital trainer kit, IC 7476, IC7474, IC 7408, IC7432 & IC 7404, patch cords +5V Power Supply.

Theory :-

A flip flop is an electronic device which is having two stable states and a feedback path which is used to store 1 bit of information by using the clock signal. Hence to say it simply, flip flops are clocked. They are use to store only 1 bit of information and it can remain in the same states until the clock signal affects the state of the input.

There are four types of Flipflops :-

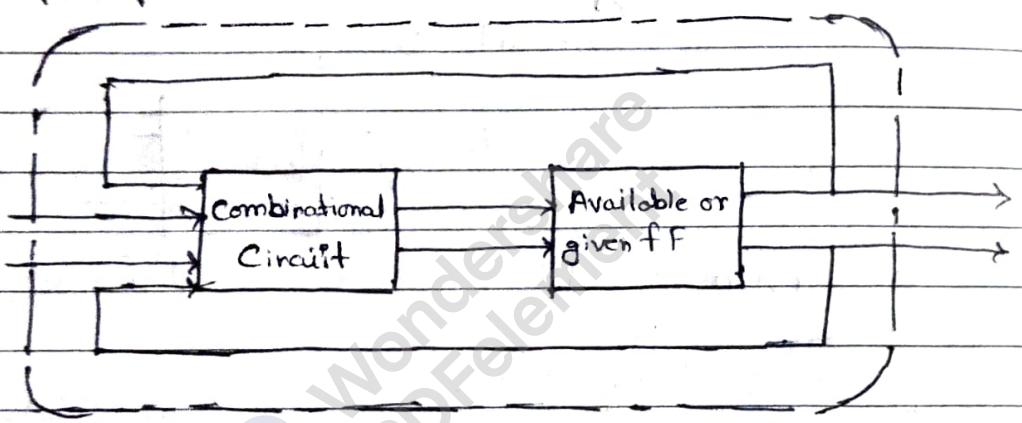
1. SR flip flop
2. D Flip flop
3. JK flip flop
4. T flip flop

There might be a situation where the less popular flip flops are required in order to implement a logic circuit. In order use the less popular flip flop.

SR Flip flop to JK flip flop
SR flip flop to D flip flop
SR flip flop to T flip flop
JK flip flop to SR flip flop
JK flip flop to D Filip flop
D Flip flop to SR Flip flop
D flip flop to JK Flip flop
D flip flop to T flip flop.

General model to convert one type of FF to other F:-

In order to convert one flip-flop to other type of flip-flop, we should design a combinational circuit that is connected to actual flip-flop. Outputs of combinational circuit as same as inputs of available flip-flops.



1. Conversion of JK flip flop to D Flip flop.

TT. of D Flip flop

Input	Output	
D	Q_n	Q_{n+1}
0	0	0
0	1	0
1	0	1
1	1	1

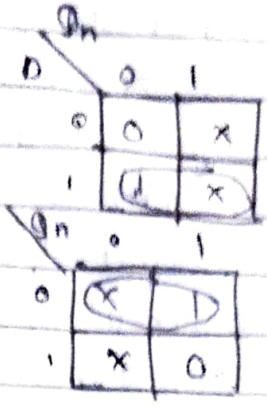
Excitation table of JK

Outputs		Inputs	
Q_n	Q_{n+1}	J	K
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

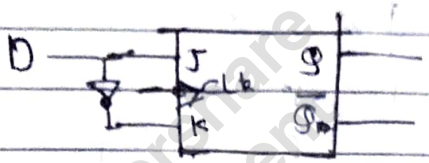
3. Conversion Table

D	Q_n	Q_{n+1}	J	K
0	0	0	0	x
0	1	0	x	1
1	0	1	1	x
1	1	1	x	0

K-map



Circuit Design



Conversion of JK Flip flop to T Flip flop

TT or T Flip Flop

Input T	Outputs Q_n	Q_{n+1}
0	0	0
0	1	1
1	0	1
1	1	0

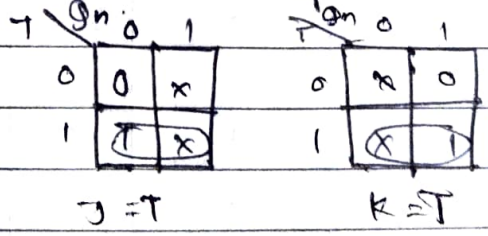
Excitation Table

Inputs Q_n	Q_{n+1}	Outputs J	K
0	0	0	x
0	1	1	x
1	0	x	1
1	1	x	0

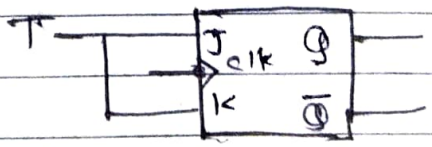
Conversion

T	Q_n	Q_{n+1}	J	K
0	0	0	0	x
0	1	1	x	0
1	0	1	1	x
1	1	0	x	1

K-map



circuit Design ⟹



Conclusion:- Thus we have studied conversion of JK flip flop to D flip flop & JK flip flop to T flip flop.