



DAY-87

#100DAYSOFRTL

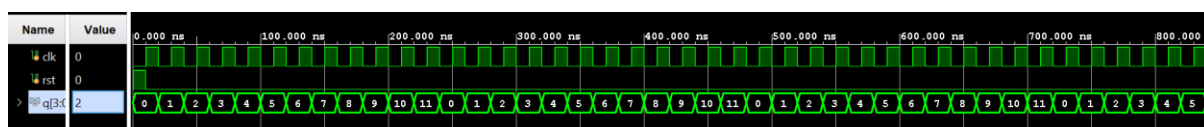
Aim:- Implementation of **Modulo 12 Counter** counts from 0 to 11 using T Flip-Flop.

RTL CODE:-

```
///DATE:-27/03/2024
///DAY-87
///Implementation of Modulo 12 Counter counts from 0 to 11 using Tff;
module Day_87(input clk,rst, output [3:0] q);
  wire w1,w2,w3;
  not g1(w1,q[0]);
  not g2(w2,q[1]);
  nand g3(w3,w1,w2,q[3],q[2]);
  TFF T1(clk,rst,1'b1,w3,q[0]);
  TFF T2(q[0],rst,1'b1,w3,q[1]);
  TFF T3(q[1],rst,1'b1,w3,q[2]);
  TFF T4(q[2],rst,1'b1,w3,q[3]);
endmodule

module TFF(input clk,rst,T,CLR, output reg q);
  always @(CLR) q<=0;
  always@(negedge clk ) begin
    if(rst)
      q<=0;
    else begin
      case (T)
        1'b0:q=q;
        1'b1:q=~q;
      endcase
    end
  end
endmodule
```

WAVEFORMS:-



TESTBENCH:-

```
module Day_87_tb();  
  reg clk,rst;  
  wire [3:0] q;  
  Day_87 uut(clk,rst,q);  
  ○ always #10 clk=~clk;  
  ○ initial clk=0;  
  initial begin  
  ○ rst=1; #10;  
  ○ rst=0;  
  ○ #20;  
  end  
endmodule
```

SCHEMATIC:-

