

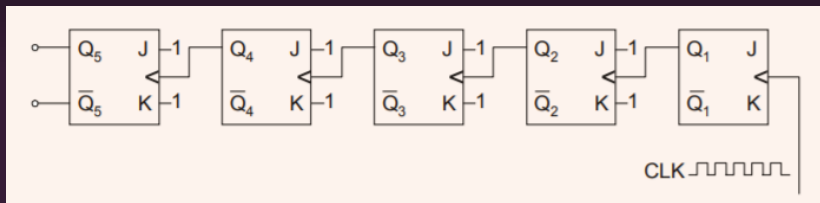
# ASSIGNMENT 10

LEELA MADHURI

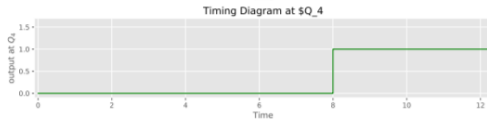
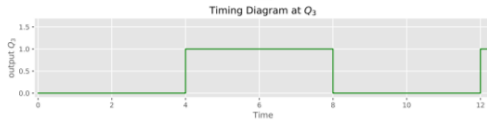
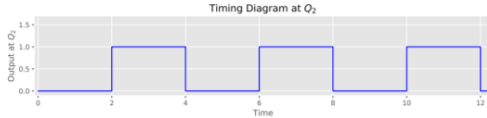
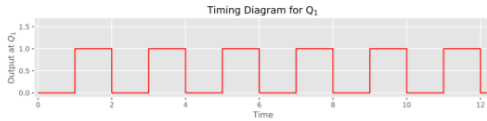
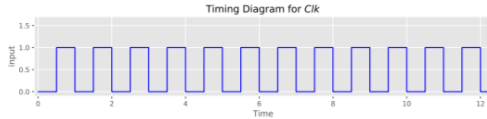
JAN 5 , 2021

## QUESTION AND FIGURE

The input frequency for the given counters 1 MHz,  
the output frequency observes at Q4 is



# TIMING DIAGRAM AND SOLUTION



## CONTINUATION OF SOLUTION

The time period doubles for every successive pass from one flip-flop to other. Let the initial time period and frequency be  $T, F$  as the time period is getting doubles so time period at  $Q_1 = 2T$

Similarly at  $Q_2 = 4T$  ; at  $Q_3 = 8T$  ; at  $Q_4 = 16T$

so the time period is getting increased in the form of  $2^n T$  where  $n$  can take the value of required output.

So, frequency at  $Q_4$  can be  $F = \frac{1}{T \text{ at } Q_4}$

$$F = \frac{1}{16}$$

(as initially  $F = 1\text{MHz}$  so  $T \text{ at initial} = 1 \text{ sec}$ )

Also frequency can be written as  $F = \frac{1}{2^4} = \frac{1}{16} = 62.5\text{KHz}$