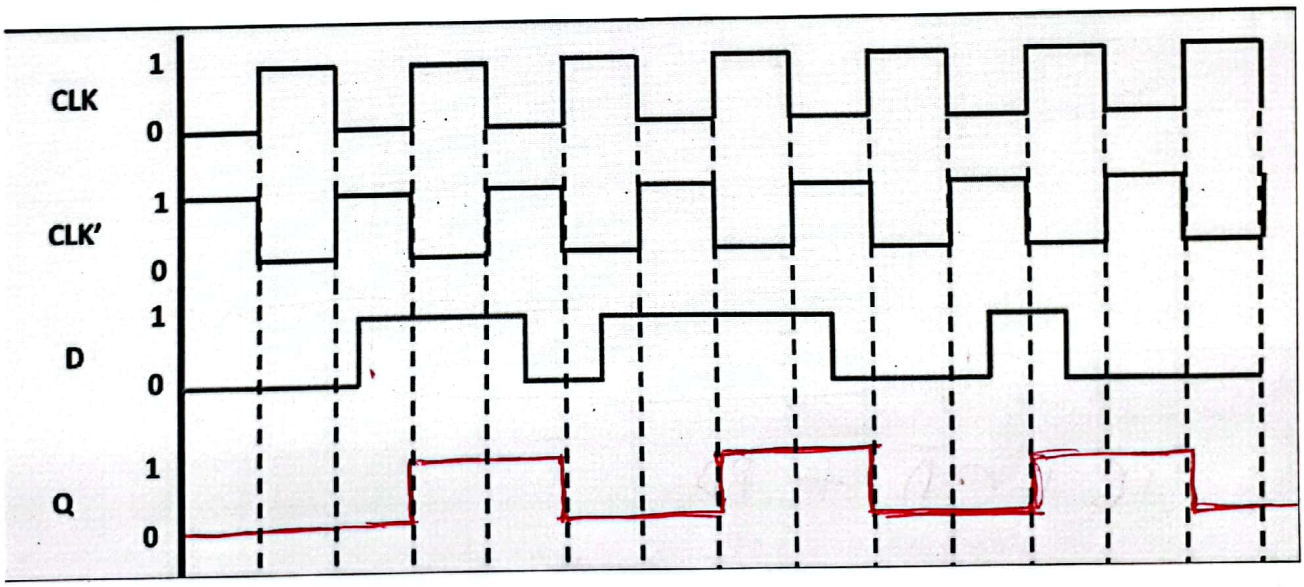
BRAC UNIVERSITY
CSE460
VLSI DESIGN
Quiz - 1
Time: 25 minutes
Set-A

Name: **ID:** **Section:**

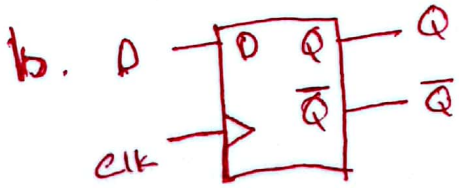
Question 1:[10 Marks]

Suppose you want to make a smart traffic system. You are using pressure sensors to detect whether a vehicle is in a lane. The sensor will keep giving you a high value if a car is on top of it. But you want your system to increase the count only when it sees a transition of the sensor value from low to high. That is, when a car just gets on top of it. You don't want the count to increase continuously when the car is on top of it.

a. Should you use a latch or flipflop to implement this? Is it positive level sensitive, negative level sensitive, positive edge triggered or negative edge triggered? **[3]**
b. Draw the symbol for what you will use. **[2]**
c. If the input of your device is as follows, draw the output. **[5]**



a. Positive edge triggered flipflop

b.


Question 2: [10 Marks]

1. Find the simplest expressions for the following tables. **[5+5]**

CD \ AB	00	01	11	10
00	1	1	1	0
01	0	1	1	0
11	0	1	1	0
10	1	1	1	0

$Y = B + \bar{A}\bar{D}$

CD \ AB	00	01	11	10
00	d	0	1	0
01	0	1	1	0
11	0	1	1	0
10	1	1	1	d

$Y = AB + C\bar{D} + BD$

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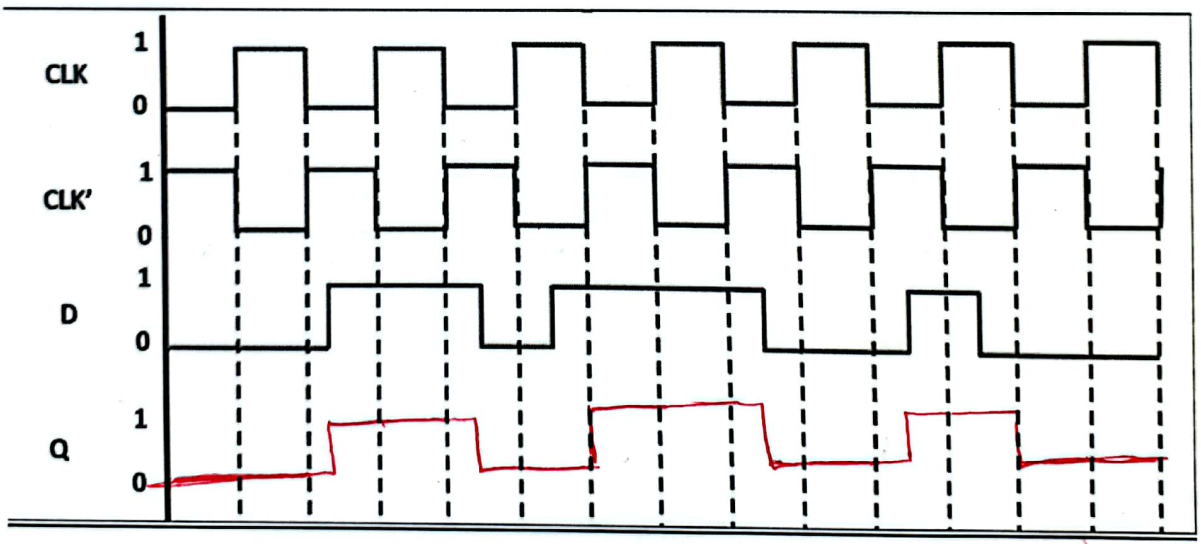
Question 1:[10 Marks]

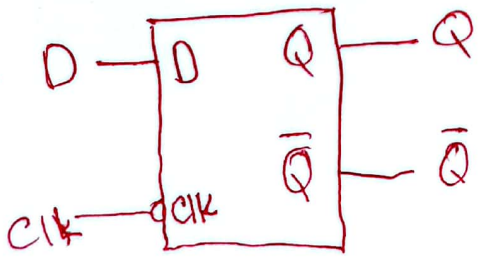
Suppose you want to transfer information from one drive to another. You have a control signal. The data will be transferred when the control signal is LOW. If it's HIGH, the old value will be held.

a. Should you use a latch or flipflop to implement this? Is it positive level sensitive, negative level sensitive, positive edge triggered or negative edge triggered? **[3]**
b. Draw the symbol for what you will use. **[2]**
c. If the input of your device is as follows, draw the output. **[5]**



a. Negative level sensitive latch

b.



Question 2: [10 Marks]

1. Find the simplest expressions for the following tables. **[5+5]**

CD \ AB	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	0	0	0	0
10	1	1	0	0

$Y = \bar{C} + \bar{A}\bar{D}$

CD \ AB	00	01	11	10
00	d	d	1	0
01	0	1	1	0
11	0	1	1	0
10	1	1	1	d

$Y = B + C\bar{D}$