College of Computer and Information Sciences
Computer Science Department
Computer Organization (CSC 220)

Homework-2

2nd Semester 2019-2020

Last date of submission: 5/04/2020 (Sunday)

Student Name: _____

Student ID: ____ _____

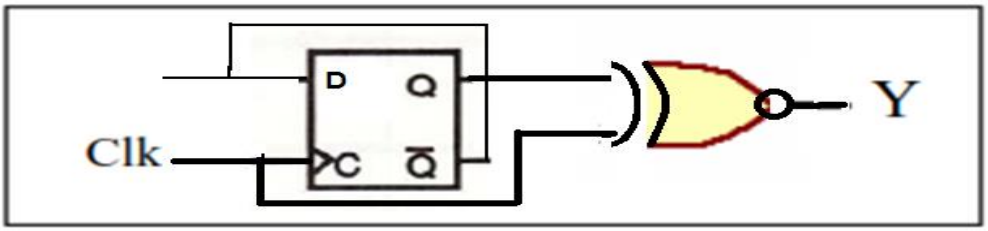
Section ID: ____ _____

Signature of the Student:

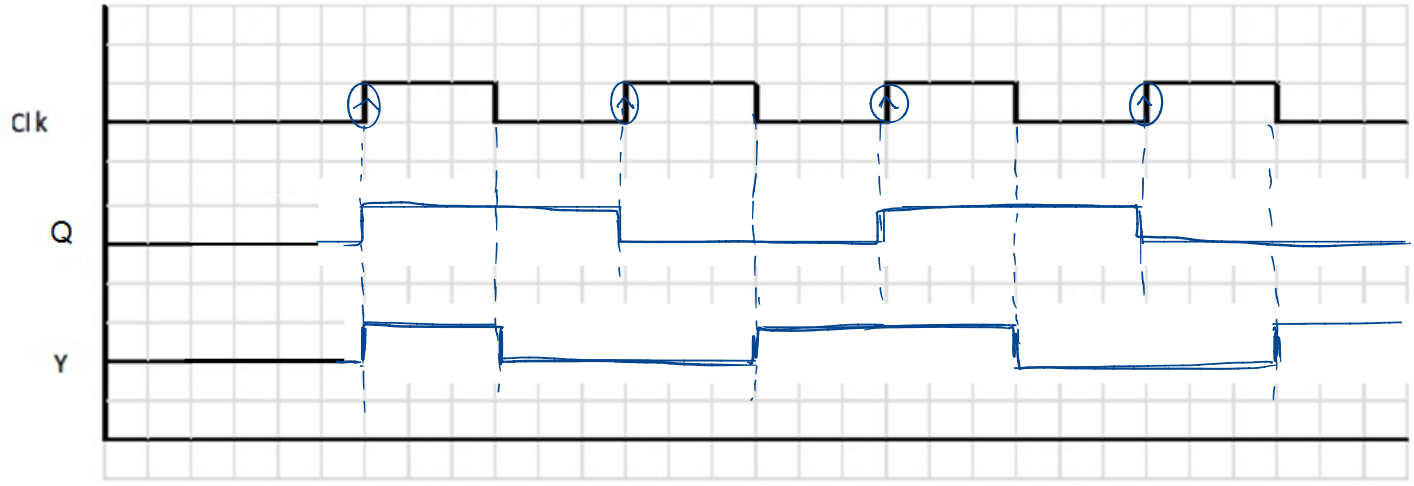
ABET Outcomes	NCAAA Outcomes
a) Apply knowledge of computing and mathematics appropriate to the discipline;	Knowledge
b) Analyze a problem, and identify and define the computing requirements appropriate to its solution	Cognitive Skills
c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;	

Section	Maximum	Score	
Q1	**1**		
Q2	**1**		
Q3	**1**		
Q4	**1**		
Q5	**1**		
Total	**5**		

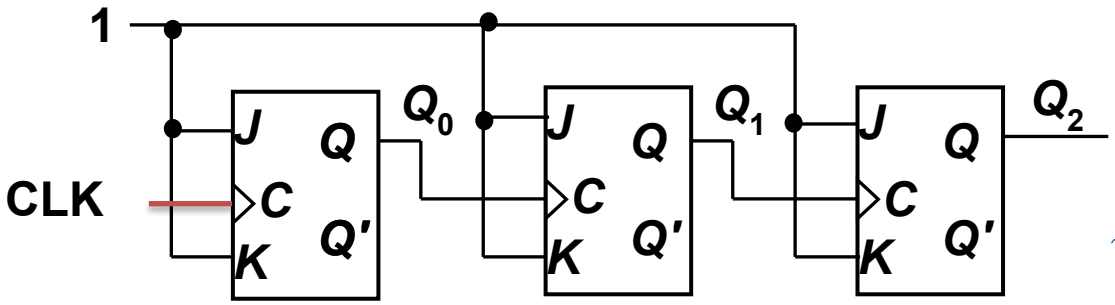
Question 1: For the given diagram below, **draw** the Q and Y activities, assuming Y and CLK start at 0?



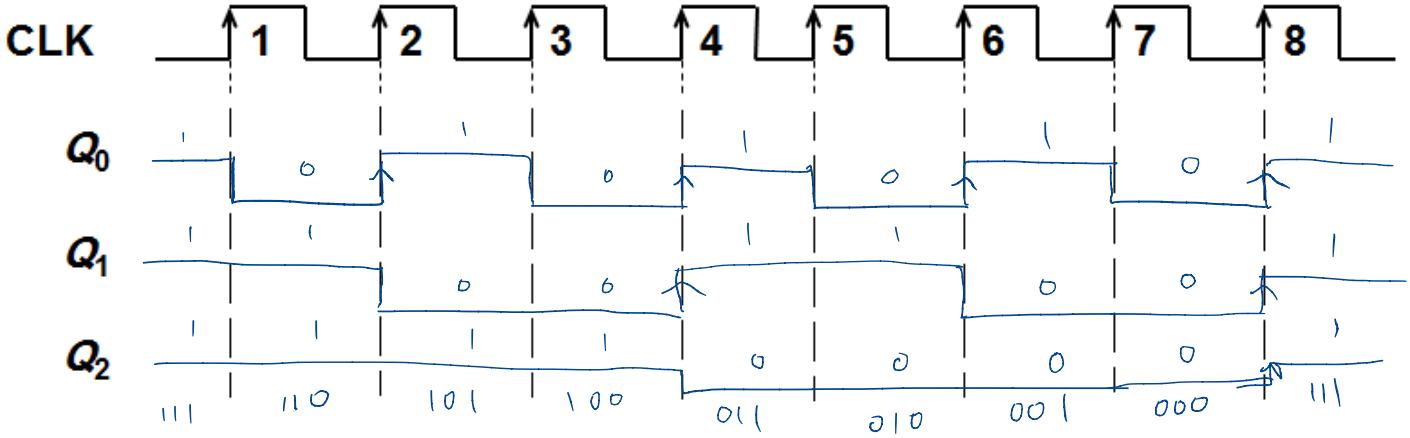
Done :)☆



Question 2: For the following asynchronous counter, draw the output waveform at Q_0, Q_1, Q_2.



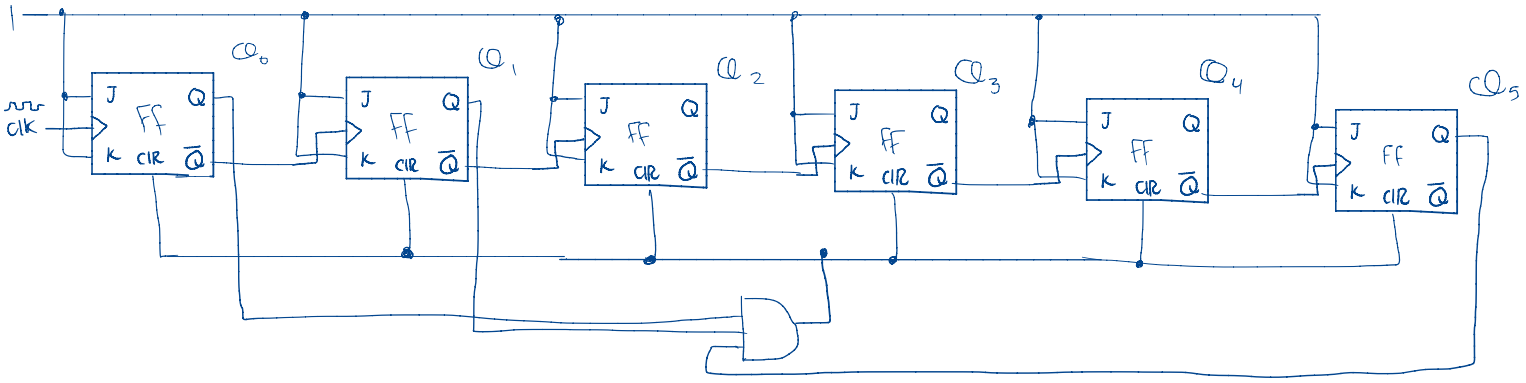
Done :)☆



Question 3: Show how to construct an asynchronous MOD-35 counter. 2^6 $35 < 64$

100011

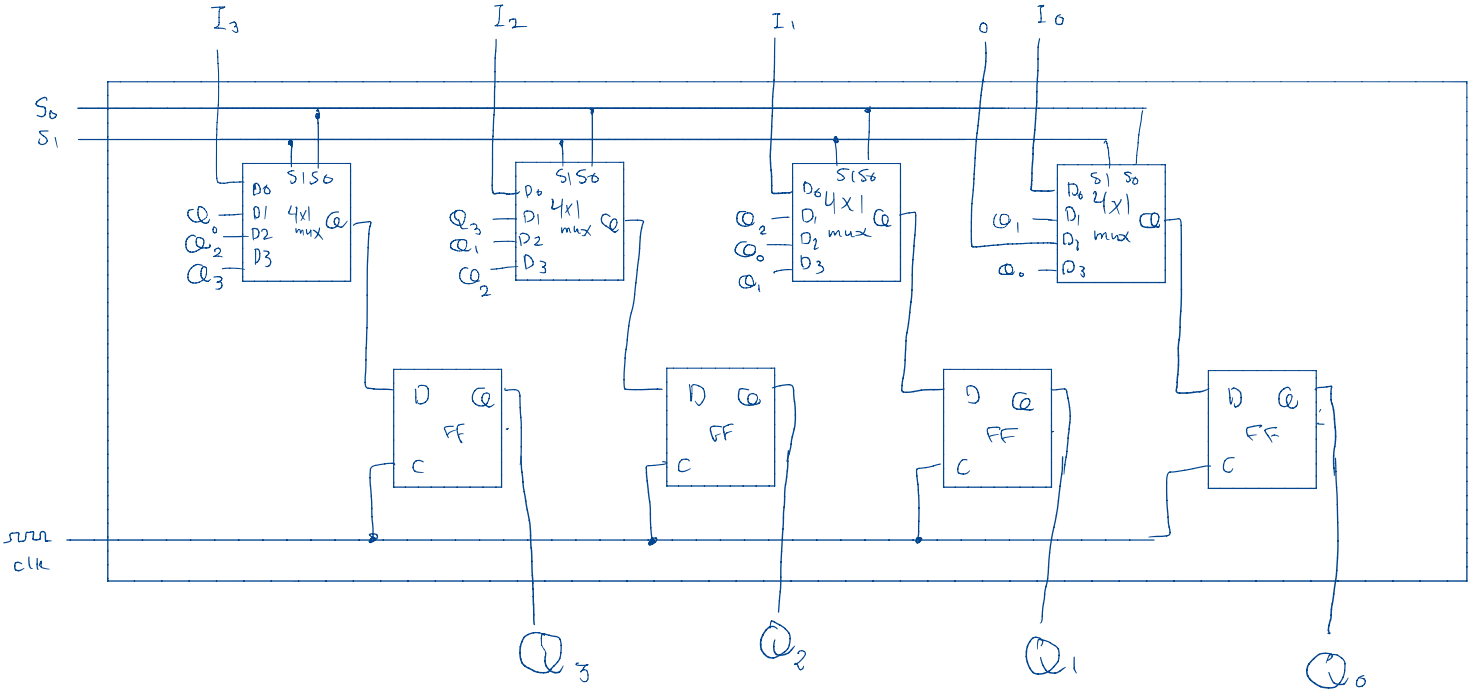
Done :) ☆



Question 4: Design a 4-bit register that can perform the following functions

S1	S0	Function
0	0	Parallel Load
0	1	Rotate right
1	0	Shift Left
1	1	No change

Done :) ☆



Question 5: Consider the following **RTL program** with the initial values of 8-bit registers R1 = 1110 0111, R2 = 0001 0111, R3 = 0010 1000 (2's complement representation). Show the contents of the registers after execution of each micro-operation sequentially.

micro-operations	R1	R2	R3
R3 ← R1 + R2	1110 0111	0001 0111	1111 1110
R1 ← R2 + 1	0001 1000	0001 0111	1111 1110
R2 ← R1 ∧ R3	0001 1000	0001 1000	1111 1110

MO1: $R3 \leftarrow R1 + R2$ =

```
  1 11
  1110 0111
  0001 0111 +
-------------
  1111 1110
```

MO2: $R1 \leftarrow R2 + 1$

```
   111
  0001 0111
  0000 0001 +
-------------
  0001 1000
```

MO3: $R2 \leftarrow R1 \wedge R3$

```
  0001 1000
  1111 1110   ∧
-------------
  0001 1000
```

Done :) ☆