National University of Computer and Emerging Sciences, Lahore Campus

Course:	Digital Logic Design Lab	**Course Code:**	EL-227	
Program:	BS(Computer Science)	**Semester:**	Spring 2020	
Duration:	60 Minutes	**Total Marks:**	10	
Paper Date:	11-June-2020	**Weight**	5	
Section:	E1	**Page(s):**	1	
Exam:	Quiz 3			

Instruction/Notes:

1. You may solve this on an A4 size paper or assignment sheets or any presentable paper.
2. You have to submit a single PDF file of the solution on the Google Classroom. You may take pictures of the handwritten solution and convert them into a single PDF file. Consider using CamScanner or similar app. Rename the PDF with your roll number. Other than PDF no other file format is acceptable.
3. The quiz is closed book and notes. You are not allowed to take help from anyone. Use of any other unfair mean is strictly prohibited.
4. Late submissions will not be allowed. So, make sure you have a back-up ready in case of power failure.

Question: A R-S flip-flop behaves as follows:
If RS = 00, the flip-flop is set to Q = 1.
If RS = 01, the flip-flop change state.
If RS = 10, the flip-flop doesn't change state.
If RS = 11, the flip-flop is set to Q = 0

Draw the State Table   (2 Marks)

R	S	Q(t)	Q(t+1)				
0	0	0	1				
0	0	1	1				
0	1	0	1				
0	1	1	0				
1	0	0	0				
1	0	1	1				
1	1	0	0				
1	1	1	0				

Complete the following table (use don't-cares when possible): (4 Marks)

Present State Q	Next State Q	R	S
0	0	1	x
0	1	0	x
1	0	x	1
1	1	x	0

Drive the Characteristic Equation/ Next State Equation. (4 Marks)

first of all make K-map of (R, S, Q(t)) for output of Q(t+1) (next state)
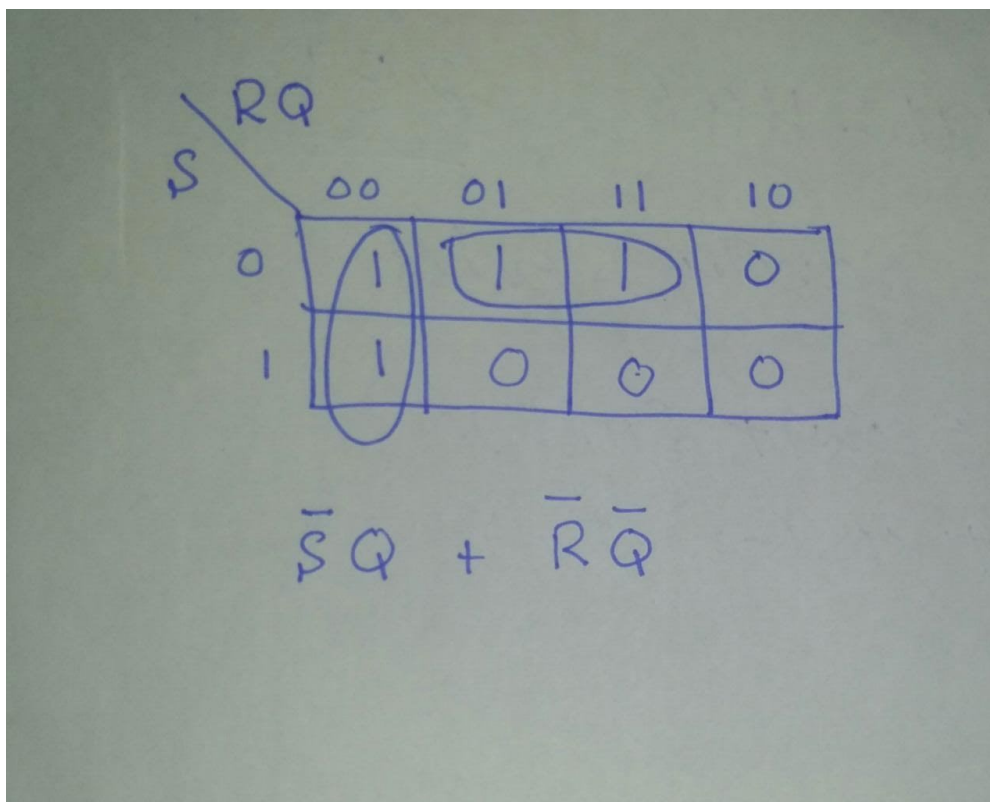
$$\bar{S}Q + \bar{R}\bar{Q}$$

Q(t+1) = S'Q + R'Q'   (Not is denoted with mark above it)