Department of Computer Science And Engineering
Bangladesh University of Engineering And Technology
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Online Assignment on
Synchronous Sequential Circuit

Section A1 & B1

CSE 206 (Digital Logic Design Sessional)

Time: 40 mins Date: 4th July, 2021

Design a control unit with synchronous sequential circuit for a vending machine that accepts 5 Taka, 10 Taka and 20 Taka notes and releases a soft drink bottle worth of 20 Taka. The machine always releases a drink whenever the deposit amount equals or exceeds 20Tk and keeps the change as deposit for the next purchase. Hence the maximum deposit amount (saved in the vending machine) at any time is 15 Tk. The machine releases the deposit amount whenever the 'CHANGE' input is given. Hence there are two outputs: Release Drink, Z_1 and Release Change, Z_2. There are two bit inputs X_1X_2 representing the input combination for your problem as follows. Please use D-flipflops in your design.

Problem 1
Roll mod 5 = 1

Input	X_1X_2
Tk 5	00
Tk 10	01
Tk 20	10
CHANGE	11

Problem 2
Roll mod 5 = 2

Input	X_1X_2
Tk 5	01
Tk 10	00
Tk 20	11
CHANGE	10

Problem 3
Roll mod 5 = 3

Input	X_1X_2
Tk 5	10
Tk 10	01
Tk 20	00
CHANGE	11

Problem 4
Roll mod 5 = 4

Input	X_1X_2
Tk 5	10
Tk 10	00
Tk 20	01
CHANGE	11

Problem 5
Roll mod 5 = 0

Input	X_1X_2
Tk 5	11
Tk 10	01
Tk 20	00
CHANGE	10

Report:
Create a PDF document containing the truth tables, K-maps, circuit diagram etc. Submit the PDF file and the .circ file simulated in Logisim in a single zip file named <Roll_No>.zip.