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Department of Computer Engineering
Final Examination
EGCI 234: Digital Circuit Design (T2/2021-22)

WebEx Q3

Date: 4 April 2022

Time: 2 Hours   Total Mark: 50 marks

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Instruction: Answer all questions and submit to our Google Classroom

Questions 1 & 2 25 minutes/ 5 & 9 marks (1000-1025) **MSI & Arithmetic Circuits**
    - 5 min break –
Questions 3 15 minutes/ 3 & 5 marks (1030-1045) **Flip Flops**
    - 5 min break –
Questions 4 20 minutes/ 10 marks (1050-1110) **Sequential Circuit Design**
    - 5 min break –
Questions 5 20 minutes/ 4 & 8 marks (1115-1135) **ADC & DAC**
    - 5 min break –
Questions 6 10 minutes/ 6 marks (1140-1150) **Digital Circuit Design**

Explanation

Examination will start at 1000. Questions 1 & 2 will be released via Google classroom. Students have 25 minutes to answer the question and submit to Google classroom before deadline (ie. 1025). Followed by 5-minute break. Then questions 2 will be released ..

(8 marks) Flip Flops

(3 marks) Q3A Explain asynchronous inputs (PRE and CLR) of FFs.

Asynchronous inputs of FFs are active low input. They are prioritized before the clock signal and JK or D. If PRE is 0 and CLR is 1 (active low), the output will be set to 1. If PRE is 1 and CLR is 0, the output will be change to 0. If both PRE and CLR are 1, the output will be determined by clock signal, JK or D. The case of both are 0 will not be used.

(5 marks) Q3B Assume that at t_0, Q is 1 and Q' is 0, if J and K are both 1s, **explain** what will happen after we apply CLK*

(a)   (b)