13.12.2019

Istanbul Technical University

Department of Computer Engineering

BLG 231E - Digital Circuits

Assignment 5

Due Date: 19.12.2019, **Thursday,** 16:00.

- Please **write and draw <u>neatly</u>** and <u>prepare your homework on computer</u>.
- Show complement signs by inserting a dash over the character such as: $\bar{x}$
- **Consequences of plagiarism:** Any cheating will be subject to the University disciplinary proceedings.
- **No late submissions** will be accepted.
- **Submissions:** Please submit your solutions to the Digital Circuits Course Assignment Box.
- If you have any question, please send e-mail to pamay@itu.edu.tr

1. Analyze the synchronous sequential circuit given in the figure below by answering following questions.

    - Determine the input functions of the flip-flops.
    - Determine the next states (use Q_0 for JK-FF, and Q_1 for D-FF) and output expression.
    - Derive the state/output table.
    - Draw the state transition diagram.

2. Assume that the machine is in state 00 and the output is also 0. Write the shortest possible sequence of X (consecutive values of X) that makes the output 1.