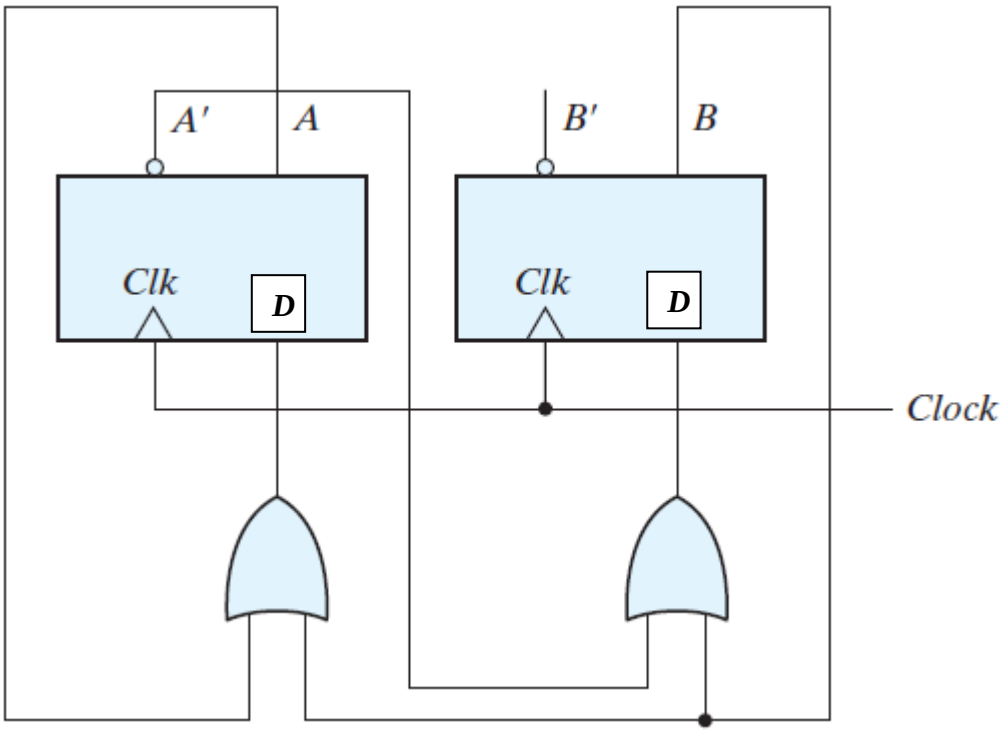
North South University, Dhaka, Bangladesh
Dept. of Electrical and Computer Engineering
Course Title: Digital Logic Design
Final Examination

Time: 35 minutes + 10 minutes (for uploading answer) Total Marks: 20

Instructions:

- You are required to submit **handwritten answers for all questions and upload a single PDF with the answers**.
- **Answer the questions in a numerical order** (Ques 1 first, then Ques 2, and so on)**.**
- You **must show all necessary steps** that are required to answer a specific question.
- You **must mention your Name and ID** on top of every page of your answer script.
- Any sorts of plagiarism, or unauthorized assistance will be considered as a serious act of violation of academic conduct and will be dealt accordingly (e.g. marks deduction).

[Q1] Derive **the state table and the state diagram** of the for the following sequential circuit. Note that *A* and *B* are the outputs (i.e. state variables) for the shown *D*-FlipFlops, and there are no external inputs and outputs for the circuit. **[8]**



[Q2] Design a **3-bit Down-counter using *T* Flip-flops**. For your design you are required to **show the state diagram, state table, input equations using K-map, and circuit diagram.** **[12]**