Bilkent University, EEE 102 Digital Design 2nd Midterm Exam

Each question must be solved on a separate blank sheet. On top of each sheet, you must write and sign the following honor code:

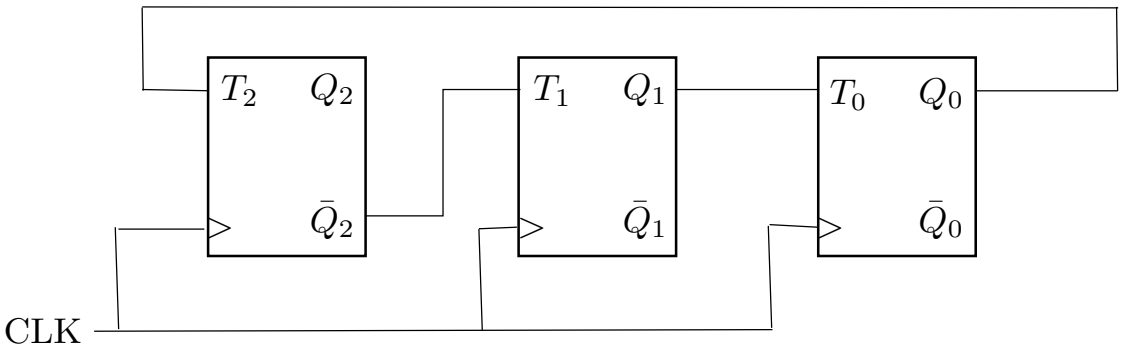
On my honor, I have neither given nor received unauthorized aid on this exam question

Your full name: **Your signature:**

Questions solved without a signed honor code **will not be graded. Solutions must be hand written. Typed solutions will not be graded.**

Question 2 [25 pts]

(i) Consider the circuit below that consists of T flip flops with output $Q_2Q_1Q_0$:



Draw the timing diagram for the output, starting from state $Q_2Q_1Q_0 = 000$, for the next 6 CLK cycles. [10 pts]

(ii) When we start from $Q_2Q_1Q_0 = 000$ in the circuit above, which states will never be visited? [5 pts]

(iii) Construct a PR flip flop, whose characteristic table is given below, using a T flip flop and AND, OR, NOT gates. [10 pts]

P	R	Q(t+1)
0	0	Q'(t)
0	1	Q(t)
1	0	1
1	1	0