1. Given the following next state and output equations for a synchronous sequential circuit:

$Q_1^+ = D_1 = X_1X_0Q_1 + Q_1Q_0 + X_1Q_0$
$Q_0^+ = D_0 = X_1Q_1' + X_0Q_1' + X_1'Q_0 + X_0'Q_0$
$Z = Q_1Q_0'$

a. Construct the transition table (state table) for the circuit showing present states, next states and outputs.
b. Draw a state graph for the circuit.

2. Design a state graph and state table for a Moore sequential circuit that has two inputs (X_1 and X_2) and one output (Z). The output begins at 0 and becomes 1 when $X_1 = 1$ and $X_2 = 1$, either concurrently or one after the other (in either order). The output returns to 0 when $X_1 = X_2 = 0$. Below is a sample input and output sequence:

X_1	0	1	0	0	1	0	0	0	1	1	0	1	1	0	
X_2	0	0	1	1	0	0	1	1	0	0	0	1	0	0	
Z		0	0	1	1	1	0	0	0	1	1	0	1	1	0