L10 practice problems

CMOS Logic

Determine the truth tables for the following CMOS logic circuits.

From *Digital Design*: *Principles and Practices*, Fourth Edition, John F. Wakerly, ISBN 0-13-186389-4.
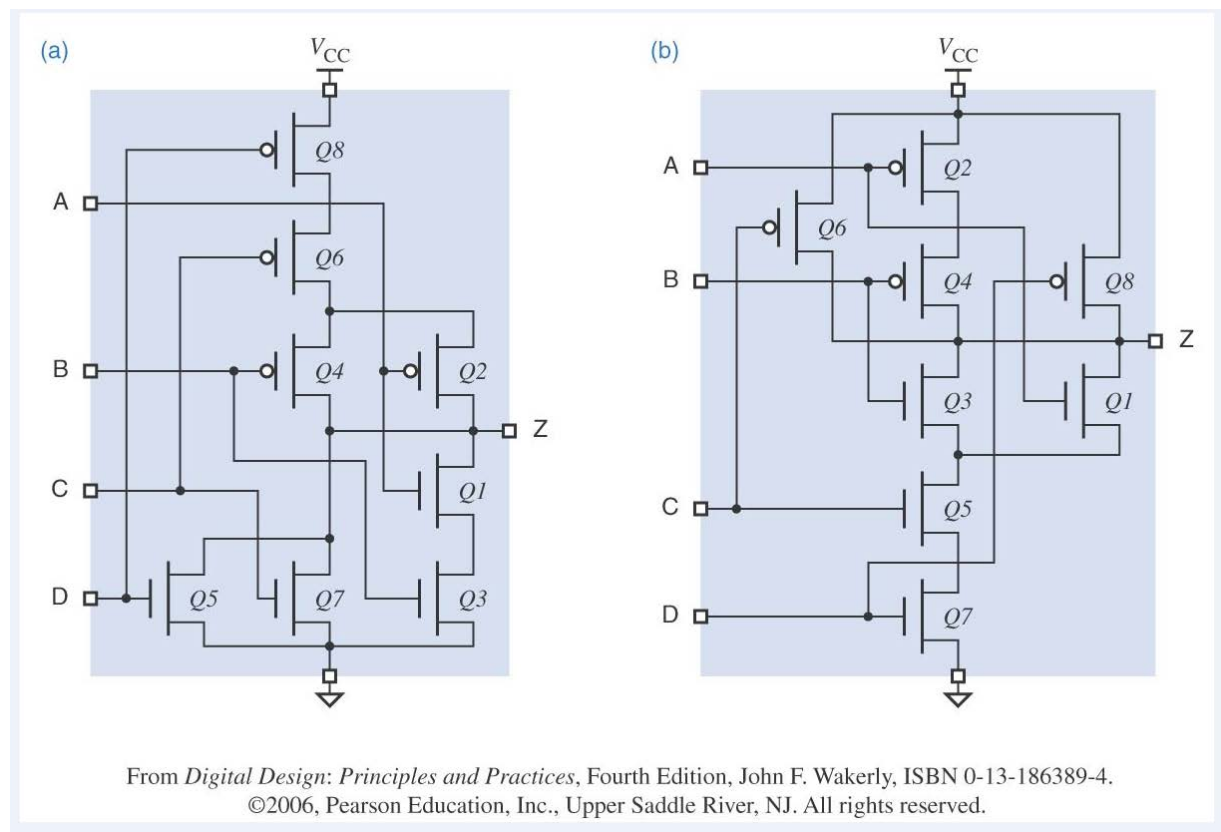©2006, Pearson Education, Inc., Upper Saddle River, NJ. All rights reserved.

Fig. X3.11

Hint:
From the circuit diagram
Step 1: identify the inputs (e.g. A, B, C, D)
Step 2: identify the pair of transistors directly controlled by each input (e.g. input A controls Q1 and Q2)
Step 3: identify all the possible current paths (series as well as parallel) from Vcc to output so as to make output = 1.
For each possible path, identify the correct input values, and fill up the corresponding rows in the truth table with output=1
Step 4: identify all the possible current paths (series as well as parallel) from output to GND so as to make output = 0.
For each possible path, identify the correct input values, and fill up the corresponding rows in the truth table with output=0