1. (5 points) Draw a circuit that directly implements the logic function 
   \((B + C')A + (A'B + D)C'\). Do not simplify the expression first. Use only simple gates.
2. (5 points) The simulation output shows selected signals from the processor introduced in section 1 of the course notes. The portions of the output corresponding to two different instructions are outlined. Identify the instructions that are being executed. Give the name of the instruction (e.g. direct store, branch-on-positive) and its complete numeric representation. Note that some parts of the simulation output have been blanked out.

0000  halt – halt execution
0001  negate –  \( ACC := -ACC \)
1xxx  immediate load – if sign bit of xxx is 0 then \( ACC := 0xxx \) else \( ACC := fxxx \)
2xxx  direct load – \( ACC := M[0xxx] \)
3xxx  indirect load – \( ACC := M[M[0xxx]] \)
4xxx  direct store – \( M[0xxx] := ACC \)
5xxx  indirect store – \( M[M[0xxx]] := ACC \)
6xxx  branch – \( PC := 0xxx \)
7xxx  branch if zero – if \( ACC = 0 \) then \( PC := 0xxx \)
8xxx  branch if positive – if \( ACC > 0 \) then \( PC := 0xxx \)
9xxx  branch if negative – if \( ACC < 0 \) then \( PC := 0xxx \)
axxx  add – \( ACC := ACC + M[0xxx] \)