Math 2013 - Introduction to Discrete Mathematics

Quiz #1 - 2005.08.24

Solutions

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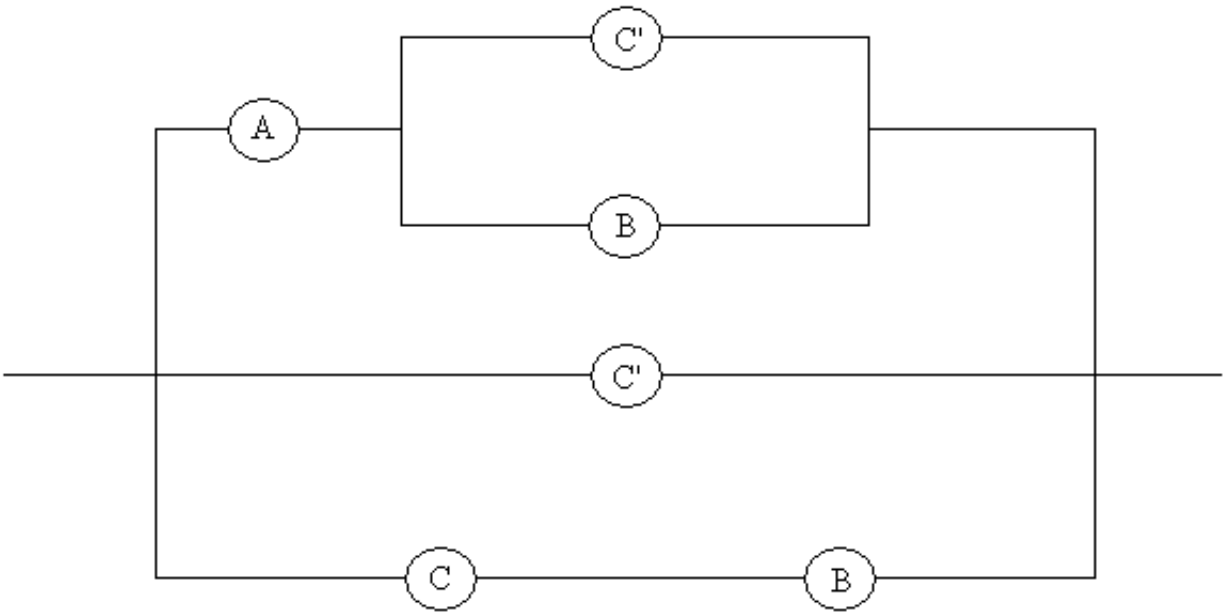
1. Draw a switching network corresponding to the following symbolic statement.

$$[A \wedge (C' \vee B)] \vee C' \vee [C \wedge B]$$

The following diagram depicts one possible switching network diagram that could be drawn using the above symbolic statement.



2. Using a truth table, determine whether or not the switch from problem 1 is open or closed. If it is closed, list all the possible combinations of values of A, B and C which make the switch closed. Remember that a value of 1 corresponds to a true, and 0 to false.

First we compute the truth table for the statement from problem 1.

A	B	C	$C' \vee B$	$A \wedge (C' \vee B)$	$C \wedge B$	$C' \vee [C \wedge B]$	$[A \wedge (C' \vee B)] \vee C' \vee [C \wedge B]$
T	T	T	T	T	T	T	T
T	T	F	T	T	F	T	T
T	F	T	F	F	F	F	F
T	F	F	T	T	F	T	T
F	T	T	T	F	T	T	T
F	T	F	T	F	F	T	T
F	F	T	F	F	F	F	F
F	F	F	T	F	F	T	T

The following values of (A, B, C) will make the switch closed: $(1,1,1), (1,1,0), (1,0,0), (0,1,1), (0,1,0), (0,0,0)$