1050 Quiz **QL19**, Mar 14, 2006. NAME:_____. Grade:_____ (____/10)
Closed books. Individual test. Do not look at other people's work. Please write legibly.

---

1) How many different functions of two variables are there? Justify your answer.

16. There are 4 entries in the truth table of such a function. Hence, there are 2^4 different truth tables.

---

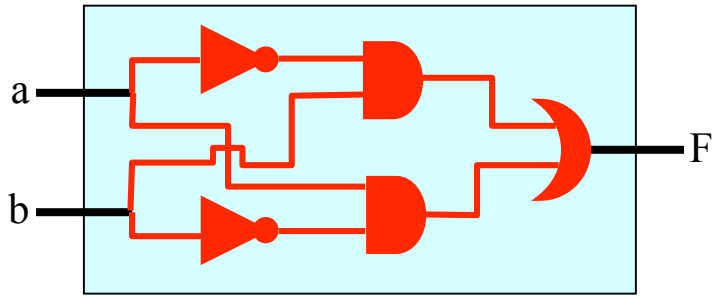
2) Provide the disjunctive form and the disjunctive normal form of $f(x,y,z)=x(y+\bar{z})$

Disjunctive: $xy+x\bar{z}$. Disjunctive normal: $xyz+xy\bar{z}+xy\bar{z}$.

---

3) Express the function F(a,b) for a 2-switch light control system and draw its circuit using AND, OR and NOT gates.

$F(a,b) = \bar{a}b + a\bar{b}$



---

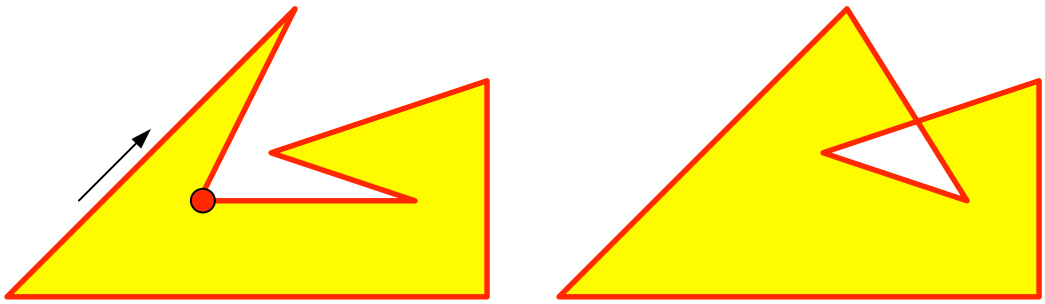
4) Define the Voronoi region of a site A in the plane.

The set of all points that are closer to A than to any other site.

---

5) Consider a simple polygon P (loop of edges that interpolate a cyclic set of vertices) with a clockwise orientation. Define the convex hull H(P) of P. Can it be obtained by removing one at a time the left-turn vertices of P? Provide an argument or a counter-example.

H(P) is the intersection of all convex sets containing P.



Removing the left-turn red-dot vertex from the polygon (left) will create a self-intersecting polygon with only right-turn vertices.