Name: _____

Pid: _____

Note that every statement in the homework should be proved.
The only exeptions are statements that were proven in previous homework or midterms and statements proven earlier in the class.

1. (10 points) Let $f : \{0,1\}^n \to \{0,1\}$ be a Boolean function such that $f(x_1, \ldots, x_n) = 1$ iff $x_1 \wedge \ldots x_n = 1$. Show that $D(f) \geq n$.

2. (10 points) Show that there is a function $f : \{0,1\}^n \to \{0,1\}$ such that

   1. $D(f) = O(\log n)$ and
   2. for any $k \in [n]$, $a_1 = \cdots = a_k = 1$, and $a_{k+1} = a_{k+2} = \cdots = a_n = 0$, $f(a_1, \ldots, a_n) = 1$ iff $k \equiv 0 \pmod 2$.