Name: _____

Entry number: _____

There are 2 questions for a total of 10 points.

1. (5 points) Consider the following predicates:

   1. $D(x)$: x is a dog.
   2. $C(x)$: x is a cat.
   3. $M(x)$: x is a mouse.
   4. $B(x)$: x barks at night.
   5. $H(x, y)$: x has y.
   6. $L(x)$: x is a light sleeper.

   Express each of the statements using quantifiers and the predicates given above. Use the domain as the set of all living creatures.

	Statement	Quantified expression
S_1	All dogs bark at night.	
S_2	Anyone who has any cats will not have any mice.	
S_3	Light sleepers do not have anything which barks at night..	
S_4	John has either a cat or a dog.	
S_5	If John is a light sleeper, then John does not have any mice.	

2. (5 points) Consider the quantified expressions $S_1, ..., S_5$ obtained in the previous problem. Use the expressions obtained in the previous problem to replace $S_1, ..., S_5$ below and then determine whether it makes a valid argument form. Explain your answer. (*If your answer is "yes", then you need to show all steps while using rules of inference*)

   S_1
   S_2
   S_3
   S_4
   $\overline{\therefore S_5}$

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