## DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

* Write your name below on the space provided.
* This test has a total of 4 pages.
* Work the problem in the space provided. If you need more space, write on the back of the test.
* To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
* Look only at your test. Don't give me the impression that you are cheating.
* Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded. A pencil must be used on all tests. Otherwise, the test will not be graded.
* If you finish early, go over the test again.


## Good luck!

| Number | Maximum | Score |
| :---: | :---: | :---: |
| 1 | 8 |  |
| 2 | 8 |  |
| 3 | 10 |  |
| 4 | 5 |  |
| 5 | 20 |  |
| 6 | 15 |  |
| 7 | 10 |  |
| 8 | 16 |  |
| 9 | 2 |  |
| 10 | 6 |  |
| Total | 100 |  |

## Name

$\qquad$


1) (4 points each) Determine if the following are statements. If not, explain why not.
a) Most people prefer Candidate A .
b) Watch out for that car!
2) (4 points each) Rewrite the following compound statements using $p, q, r \wedge, \vee, \sim$, and $\rightarrow$ as needed. Be sure to declare what the letters $p, q$, and $r$ represent. Do not allow any connectors into your definitions of $p, q$, and $r$ :
a) She learned the game and plays it every day.
b) If we don't go to the store, then I'll either stay or I'll go to the park.
3) (5 points each) Let $p=$ "I like that show. and $q=$ "I have time to watch it." Translate the following into words:
a) $\sim p$
b) $p \wedge \sim q$
4) (5 points) Let $p$ and $r$ be a true statements and let $q$ be a false statement. Show the work to determine the truth value of the compound statement: $(p \wedge \sim q) \rightarrow r$.
5) (5 points each) Negate the following statements:
a) I am going to make him an offer he can't refuse. b) You either die a hero or live long enough to see yourself become the villain
c) If you let my daughter go now, that'll
d) All the world's a stage be the end of it.
6) (5 points each) For the statement "If you walk without rhythm, you won't attract the worm." find the converse, inverse, and contrapositive:

Converse:

Inverse:


Contrapositive:
7) (5 points each) Use an Euler diagram to determine whether the argument is valid or invalid:
a) All dogs are animals.
All malamutes are dogs.
All malamutes are animals.
b) All four-legged creatures are dogs. Garfield has four legs. Garfield is a dog.
8) (16 points) Fill in the truth table chart for the statement: $(p \vee q) \wedge(p \vee \sim r)$. Be sure to label the column headings.

| $p$ | $q$ | $r$ |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| T | T | T |  |  |  |  |
| T | T | F |  |  |  |  |
| T | F | T |  |  |  |  |
| T | F | F |  |  |  |  |
| F | T | T |  |  |  |  |
| F | T | F |  |  |  |  |
| F | F | T |  |  |  |  |
| F | F | F |  |  |  |  |

9) (2 points) Is the statement $(p \vee q) \wedge(p \vee \sim r)$ in number 8 a tautology? Why or why not?
10) ( 5 points) For the following argument...
a) Rewrite it using $p, q, r \wedge, \vee, \sim$, and $\rightarrow$ as needed. Be sure to declare what the letters $p, q$, and $r$ represent.
b) Write the complete statement that would be the conjunction of the premises implying the conclusion. Do not construct the truth table.

If you have allergies, then you have a fish.
a)

If you do not have a fish, then you have a cat.
If you have a cat, then you do not have allergies.
b)

