(27) Nothing is better than liberty
Prison life is better than nothing
∴ Prison life is better than liberty

(28) All gold is metal
Something that glitters is not gold
∴ All that glitters is not metal

(29) All that glitters is not gold
Aurum glitters
∴ Aurum is not gold

(30) Every cow is cloven-footed
Every cow is ruminant
∴ Every ruminant is cloven-footed

(31) Man is studied by psychology
The white rat is not man
∴ The white rat is not studied by psychology

(32) Man is studied by psychology
Hopkins is man
∴ Hopkins is studied by psychology

(33) All who are not guilty are innocent
He is not guilty
∴ He is innocent

(34) No american is a slave
Every slave wants freedom
∴ Some who want freedom are not American

(35) If there are no controls, prices will rise
But there are controls
∴ Prices will not rise

(36) Only if we work hard, do we succeed
But we will work hard
∴ We will succeed

(37) Only if there are no controls will prices rise
But prices will not rise
∴ There will be controls

(38) If today is monday, tomorrow is Tuesday
But today is not monday
∴ Tomorrow is not Tuesday

(39) If today is monday, tomorrow is Tuesday
But tomorrow is not Tuesday
∴ Today is not Monday

(40) If wishes were horses, beggars would ride
But beggars do not ride
∴ wishes are not horses

(41) You cannot sow the wind and not reap the whirlwind
You sow the wind
∴ you do not reap the whirlwind

(42) If a is b, a is not c
But a is not c
∴ a is b

(43) Only fools believe this
You don't believe this
∴ you are no fool

(44) If the conference does not succeed
war is inevitable
But the conference will succeed
∴ war is not inevitable.

(45) No valid syllogism has an undistributed midde
This syllogism does not have an undistributed middle
∴ This syllogism is valid

Exercise 1. Assume "All moral actions are intelligent" is true. Decide which of the following are true, which are false and which require more information to decide ~~which~~ if it's true or false.

A. All unintelligent actions are nonmoral
B. Some moral actions are not intelligent
C. No moral actions are unintelligent
D. All intelligent actions are moral
E. No intelligent actions are nonmoral
F. Some intelligent actions are moral
G. All nonmoral actions are unintelligent
H. No nonmoral actions are intelligent
I. No unintelligent actions are nonmoral
J. All unintelligent actions are moral
K. Some moral actions are intelligent
L. Some moral actions are not unintelligent
M. No intelligent actions are moral

Excercise 2. Repeat *1 assuming in addition "some intelligent actions are amoral"

Excercise 3. Repeat *1 assuming in addition "all intelligent actions are moral"

Excercise 4. Repeat *1 assuming only "some moral actions are intelligent"

Excercise 5. Draw Venn diagrams of the sets of all actions U the set of Moral actions M and the set of Intelligent actions I to reflect each of the lettered statements in *1

SAMPLE TEST 1 MAD 3105 1-4: 10 pt each 5-8: 15 pt ea

1 A. Define A tree
B Define A circuit

2. Draw a venn diagram for each of the statements to the right. Is the logic valid or not? Draw another diagram that supports your conclusion

All birds fly
All geese fly
∴ All geese are birds

3. A certain recurrance relation's characteristic Polynomial has roots $-\frac{1}{2}, 1, 1, 1, 2, 3, 3$. Write the general solution to the homogeneous problem

4. The recurrence relation in #3 has forcing function $f(n)$. For each of the $f(n)$'s below, give the correct form of the guess for the particular solution
A. $5 \cdot 4^n$ B. $6 \cdot 2^n$ C. $-\frac{1}{3} 3^n$ D. $n+1$ E. $4n \cdot (-\frac{1}{2})^n$

5. Solve $a_n - 6a_{n-1} + 8a_{n-2} = 0$ $a_0 = -1$ $a_1 = 0$

a little on the easy side

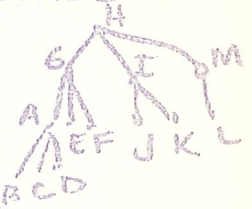
6. Prove: If in a graph G there is a path $x \to y$ and a path $y \to z$, then there is a path $x \to z$

7. Prove A tree has no circuits

8. Prove by induction (on the number of vertices) that a rooted tree has at least one leaf
(HINT: DELETE THE ROOT)

Other subjects that are "fair game" ("so far" = by Fri 17 Sept)

1. the other parts of recurrence relations covered so far
2. An m-ary tree has 103 leaves, how many vertices and give a lower bound on the height.
3. In the rooted tree to the right: list all of A's sons, parents, sisters, ancestors



7. List the trees with 6 edges.

4. proving algebraic or inequalities by induction
5. Other Definitions & Theorems covered so far
6. Negate the statement "For each girl there is a boy which make a good mate" in a form that the not is inside all the quantifiers.

BACK PROBLEM