Name: ________________________________

SECTION 1: SYLLOGISTIC LOGIC (18 pts)

Translate the following sentences into syllogistic wffs. (2 pts each) (6)

1. Only students can vote in the student body referendum.

2. Not all who go to college finish their degree.

3. No one believes in God unless they have faith.

Determine whether the syllogistic argument is valid or invalid using the star test. (2 pts)

4. j is P
some P is T
no T is Q
∴ j is not Q

Determine whether the syllogistic argument is valid or invalid using a Venn Diagram. You may also use the star test. (3 pts each) (6)

5. all D is E
some D is not F
∴ some E is not F

6. all A is B
some C is B
∴ some C is A

Translate the following argument into syllogistic form and determine validity or invalidity using either the star test or a Venn Diagram. (4 pts)

7. True principles don't have false consequences. There are plausible principles with false consequences. Hence not all true principles are plausible.

SECTION 2: PROPOSITIONAL LOGIC (38 pts)

Translate the following sentences into propositional wffs. (2 pts each) (8)

8. You can stay only if you pay rent.

9. Having cable is a necessary condition for watching the game.

10. Provided that you've turned the application in on time and that you've completed all the requirements, your application will be accepted.

11. She'll go to the party with Joe or Lauren, but not with Suzie.

Determine whether the argument is **valid** or **invalid** using a **truth table**. (3 pts each) (6)

12. $((L \bullet M) \supset G)$
$\sim M$
$\therefore \sim G$

13. $(\sim A \equiv (\sim B \supset C))$
A
$\sim C$
$\therefore B$

Translate the following arguments into propositional form and determine validity using either a truth table, the truth assignment test, or a proof. (4 pts each) (8)

14. Presuming that we followed the map, then unless the map is wrong there's a pair of lakes just over the pass. We followed the map. There's no pair of lakes just over the pass. Hence the map is wrong.

15. Assuming that it wasn't an inside job, then the lock was forced unless the thief stole the key. The thief didn't steal the key. We may infer that the robbery was an inside job, inasmuch as the lock wasn't forced.

Prove or refute the following propositional arguments, using multiple assumptions if necessary. If you have a refutation box, perform the truth-assignment "check" and show evidence of your work. (4 pts each) (20)

16.

1 (I ⊃ (U • ~C))
2 (U ⊃ (D v E))
3 (D ⊃ A)
4 ~A
5 (E ⊃ C)
[∴ ~I

17.

1 ((A • B) ⊃ C)
2 ((C v D) ⊃ ~E)
[∴ ~(A • E)

18.

1 $(A \supset (B \supset C))$
2 $(B \vee \sim(C \supset D))$
[∴ $(D \supset \sim(A \vee B))$

19.

1 $(\sim P \equiv Q)$
[∴ $\sim(P \equiv Q)$

SECTION 3: PREDICATE LOGIC (44 pts)

Translate the following sentences into predicate logic. Hint: These do not have identity or relations. (2 pts each) (8)

20. All kittens who purr are cute.

21. Some politicians are idealistic and practical.

22. If Jacob won an award, then someone won an award.

23. If all are wizards, then there is magic.

Translate the following sentences into predicate logic. Hint: These **do** have identity and relations. (3 pts each) (12)

24. Obama is the Democratic candidate.

25. There are at least two political parties.

26. There is exactly one presidential candidate.

27. No woman besides my grandmother loves Chuck Norris.

Prove or refute the following quantificational arguments, using multiple assumptions if necessary. If you have a refutation box, perform the truth-assignment "check" and show evidence of your work. (4 pts each) (24)

28.

1 (x)(~Wx ⊃ Ax)
[∴ (x)(~Ax ⊃ Wx)

29.

1 (x)(Fx ⊃ Gx)
2 ~(x)Gx
[∴ (x)~(Fx • Gx)

30.

1 ((x)Fx v (x)Gx)
[∴ (x)(Fx v Gx)

31.

1 a=b
2 (x)(Fx ⊃ Gx)
3 ~Ga
[∴ ~Fb

32.

1 ~(x)(y)Lxy
[∴ ~(x)Lxu

33.

1 (x)(y)(Cxy ⊃ Bxy)
2 ~(∃x)Bxx
[∴ ~(∃x)Cxx