NAME:

MID-TERM EXAM
INTRODUCTION TO LOGIC
PHIL 1

Date
Student Number:
Signature:

The exam is structured in 3 sections. Section 1 worth 32 marks, Section 2 worth 45 marks, and Section 3 worth 21 marks. Total marks available = 98. The remaining 2 marks (needed to reach 100) are given by me to you as a present. So, everyone starts the exam with 2 marks on their bag.
Good luck!

SECTION 1
THEORY
(up to 32 marks, 8 questions for 4 marks each).

1. What are the steps involved in assessing a logical argument?
a. studying and elaborating the argument
b. reconstructing the argument
c. assessing the argument
d. **identifying, reconstructing, and evaluating the argument**

2.What are the four basic categorical propositions in categorical logic?
a. **A, E, O, I**
b. C,D,E,F
c. A,E,O,C
d. D, A, E, W

3.What does get distributed in O statements?
a. subject
b. **predicate**
c. subject and predicate
d. none of the above

4. If a valid argument has a false conclusion, then at least one premise must be false
Is this true or false?

Write your answer here and explain why: **True**

A valid argument cannot have all true premises and a false conclusion. So, if a valid argument does have a false conclusion, it cannot have all true premises. Thus, at least one premises must be false

5. If an invalid argument has all true premises, then the conclusion must be false

Is this true or false? Write your answer here and explain why: **False**
It is possible for an invalid argument to have all true premises and a true conclusion. Ex: P1: All dogs are mammals.: All terriers are mammals. C: All terriers are dogs.

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6. Open Theoretical Question (answer no less than 150 words)
Explain the Differences between Stoic Logic and Categorical Logic. Then reflect on the importance of Stoic Logic for the development of Propositional Logic. What are the differences/similarities between them?
Answer: slides

7. An invalid deductive argument could have all true statements in it.

Is this true or false? _____**true**____

The conclusion of the argument could just be true by coincidence. For example, 'the sky is blue and grass is green, so you are working this problem now'. Admittedly, it is doubtful anyone would intentionally offer such an argument.

8. Translate the following statement into predicate logic

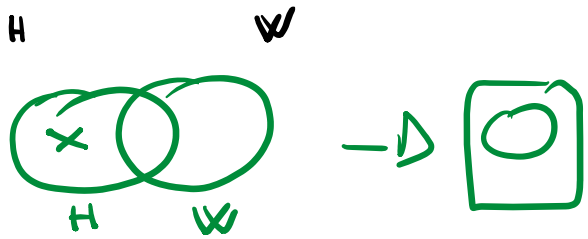
Some French Restaurants are exclusive (F,R,E)

ANSWER:

$(\exists x)[(Fx \cdot Rx) \cdot Ex]$

SECTION 2
EXERCISES (explain your answers, when needed)
(up to 45 marks, 9 questions for 5 marks each)

9. Venn Diagram the following Statement and say what sort of statement it is
Some Humans are not Women



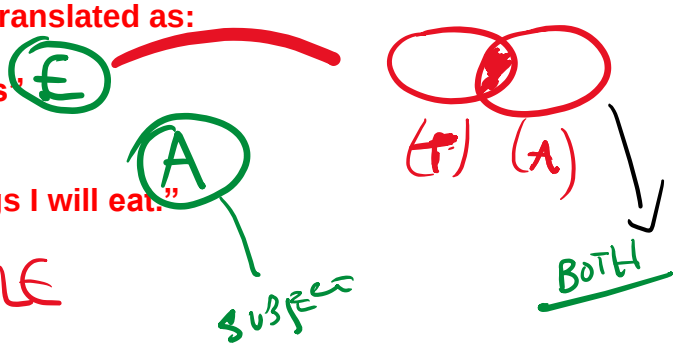
10. Rephrase the following statement in standard categorical proposition. Individuate subject, predicate, copula and quantifier. Then say which term (If any) gets distributed

"I will eat all toppings except anchovies on my pizza''

This tells us TWO things: (1) Something about what I will NOT eat, and (2) Something about what I WILL eat. So, this gets translated as:

(1) "No pizza toppings I will eat are anchovies"

AND (2) "All non-anchovies are pizza toppings I will eat."



BOTH ACCEPTABLE

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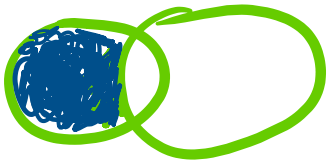
11. Rephrase the following statement in standard categorical proposition. Individuate subject, predicate, copula and quantifier. Then say which term (If any) gets distributed

No one except my friends are allowed to borrow my car

REPHRASED: "All people allowed to borrow my car are my friends''.
Subject: People…
Predicate: my friend
Copula: are
Quantifier: All



[All S are P: A statement]. Subject gets distributed

12. Determine the main operator in the following proposition. Then determine its truth values. Let *A*, *B*, and *C* be true and *X*, *Y*, and *Z* be false. Circle your answers.

$\sim[(A \equiv X) \vee (Z \equiv Y)] \vee [(\sim Y \supset B) \quad (Z \supset C)]$

13. Determine the main operator in the following proposition. Then determine its truth values. Let *A*, *B*, and *C* be true and *X*, *Y*, and *Z* be false. Circle your answers.

$(Z \supset C) \supset \{[(\sim X \supset B) \supset (C \supset Y)] \equiv [(Z \supset X) \supset (\sim Y \supset Z)]\}$

14. Translate the following statement into propositional logic then compute its value
If Hitler ran the Third Reich, then either Custer was killed by the Indians or Einstein discovered aspirin. **Note:** ***H, C = T; E=F***

ANSWER

$H \supset (C \vee E)$
T T T T F

15. Translate the following statement into propositional logic then compute its value
Both Hitler ran the Third Reich and Lindbergh crossed the Atlantic if neither Einstein discovered aspirin nor Caesar conquered China. **Note:** ***E,C = F; H,L=T***

ANSWER

13. $\sim(E \vee C) \supset (H \cdot L)$
T F F F T T T T

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16. Reconstruct the following argument
'Positive thinking cannot help you win the lottery. If it could, then lots of people would win'.

ANSWER:
1. If positive thinking could help you win the lottery, then lots of people would win the lottery. (EP)
2. Lots of people do not win the lottery. (IP)
_____
3. Therefore, positive thinking cannot help you win the lottery. (1,2)

You might also think that "Lots of people try to win the lottery with positive thinking." is assumed or implied. But that claim isn't necessary to add here in order to get a valid and relatively strong interpretation of the argument:

1. Lots of people try to win the lottery with positive thinking.
2. If positive thinking could help you win the lottery, then lots of people would win the lottery.
3. Lots of people do not win the lottery.

_____
4. Therefore, positive thinking cannot help you win the lottery.
The logical structure of the argument is now:

1. R.
2. If P then Q
3. not Q
4. Therefore, not P.

R, while relevant, doesn't contribute to the formal validity of the argument. The only valid inference here is from 2 and 3 to the conclusion 4. So let the logical structure of the argument and the requirements of validity be your guide, in part, to figure out which implicit premises must be added.

17. True or False
'A condition A is said to be sufficient for a condition B, if (and only if) the falsity (non existence/non-occurrence) [as the case may be] of A guarantees (or brings about) the falsity (non-existence/non-occurrence) of B'.

False: the above is a definition of a necessary condition not of a sufficient one

SECTION 3
MORE EXERCISES (up to 21 marks, 3 questions for 7 marks each)

18. Use truth tables to determine whether the following symbolized statements are tautologous, self-contradictory, or contingent

$$[U \bullet (T \vee S)] \equiv [(\sim T \vee \sim U) \bullet (\sim S \vee \sim U)]$$

ANSWER:

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$[U \bullet (T \vee S)]$	$\equiv$	$[(\sim T \vee \sim U) \bullet (\sim S \vee \sim U)]$
T T T T T	F	F T F F T F F T F F T
T T T T F	F	F T F F T F T F T F T
T T F T T	F	T F T F T F F T F F T
T F F F F	F	T F T F T T T F T F T
F F T T T	F	F T T T F T F T T T F
F F T T F	F	F T T T F T T F T T F
F F F T T	F	T F T T F T F T T T F
F F F F F	F	T F T T F T T F T T F

self-contradictory

19. Use truth tables to determine whether the following pairs of symbolized statements are logically equivalent, contradictory, consistent, or inconsistent

$W \equiv (B \bullet T)$ $\quad$ $W \bullet (T \supset \sim B)$

ANSWER:

$W \equiv (B \bullet T)$	$W \bullet (T \supset \sim B)$
T T T T T	T F T F F T
T F T F F	T T F T F T
T F F F T	T T T T F
T F F F F	T T F T F
F F T T T	F F T F F T
F T T F F	F F F T F T
F T F F T	F F T T F
F T F F F	F F F T F

inconsistent

20. Compute the Following Argument. Is it Valid or Invalid?

$$\begin{array}{l} A \supset (N \vee Q) \\ \sim(N \vee \sim A) \\ \hline A \supset Q \end{array}$$

ANSWER: VALID