AMERICAN UNIVERSITY OF BEIRUT
Math 211- Spring 2007

Drop Quiz 1, march 1st ,2007

Name: ……

AUB ID number: ……

Section: …….

2 pts

Question 1: Let p and q be the propositions

p: you have the flu
q: you attend the lectures

Write the following propositions using *p*, *q* and logical connectives:

1/2 a) You attend the lectures only if you don't have the flu: ……$q \rightarrow \neg p$……

1/2 b) You have the flu; nevertheless you attend the lectures: ……$p \wedge q$……

1/2 c) You don't attend the lectures whenever you have the flu: ……$p \rightarrow \neg q$……

1/2 d) You attend the lectures if you don't have the flu, and conversely: $\neg p \leftrightarrow q$……

2 pts

Question 2: Construct a truth table for each of these compound propositions:

a) $(p \vee q) \oplus (p \leftrightarrow q)$ b) $p \rightarrow \neg(p \wedge q)$

exclusive or

p	q	$p \vee q$	$p \leftrightarrow q$	$(p \vee q) \oplus (p \leftrightarrow q)$	$p \wedge q$	$\neg(p \wedge q)$	$p \rightarrow \neg(p \wedge q)$
T	T	T	T	F	T	F	F
T	F	T	F	T	F	T	T
F	T	T	F	T	F	T	T
F	F	F	T	T	F	T	T
		1/4	1/4	1/2	1/4	1/4	1/2

2 pts

Question 3: Translate each of these statements into logical expressions using predicates and quantifiers:

1/2 a) Somebody in this class has solved all the problems in the book:

U: All students in this class
V: All problems in the book
$P(x,y)$: x has solved y
$\exists x \forall y\, P(x,y)$

U: students
$P(x)$: x has solved all the pbs in the book
$\exists x\, P(x)$

1/4 b) Somebody in this class has not solved any problem in the book:

$\exists x \forall y\, \neg P(x,y)$

$Q(x)$: x has not solved any pb
$\exists x\, Q(x)$
~~$\exists x\, P(x)$~~
FALSE !!

1/4 U c) Somebody in this class has sent a message to someone else:

$P(x,y)$: x has sent a message to y
$\exists x \exists y\, (P(x,y) \wedge x \neq y)$
1/2 1/4

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