جامعة بيرزيت
BIRZEIT UNIVERSITY

Discrete Mathematics – Comp232
Mustafa Jarrar
ورقة الإجابة

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Quiz 1
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يمنع كتابة ونقل الأسئلة او جزء منها على ورقة الاجابة

Q1.A

All students love some exams
كل الطلاب يحبون بعض الامتحانات

Q1.B

If any Person in any Program enrolled atleast 1 none Math Course which includes in it's Program then he is smart
اذا أي شخص في أي برنامج سجّل على الأقل في مادة رياضيات واحدة في برنامجه فإنه ذكي.

Q1.C

$\exists X \in \text{university}, \exists y \in \text{university} \; . \; \text{SameCity}(X,y) \wedge \sim\text{Same}(X,y).$

~~$\exists X \in$ cities $\in$ have universities (X,y).~~

Q2

$HE \rightarrow SL \vee \sim EW$
$SL \rightarrow HE \wedge EW$
$\therefore HE \rightarrow EW$

~~$SL \rightarrow (HE \wedge EW)$~~
~~$SL \rightarrow HE \wedge SL \rightarrow EW$~~

$HE \rightarrow EW$

HE	SL	EW	~EW	SL ∨ ~EW	HE ∧ EW	HE → SL∨~EW	SL → HE∧EW	HE → EW
						Premises		Conc.
T	T	T	F	T	T	T	T	T ✓
T	T	F	T	T	F	T	F	F
T	F	T	F	F	T	F	T	T
T	F	F	T	T	F	T	T	F ✗
F	T	T	F	T	F	T	F	T
F	T	F	T	T	F	T	F	T
F	F	T	F	F	F	T	T	F ✗ ✓
F	F	F	T	T	F	T	T	F ✗ ✓

not Valid.

Q3. a

~~$\forall k \in \mathbb{Z}, \forall m \in \mathbb{Z}$~~

$\forall k \in \mathbb{Z}, \forall m \in \mathbb{Z}.\ odd(k) \wedge Even(m) \rightarrow odd(k^2+m^2)$.

Q3. b

let k, m are P.b.ac (particular but ordinarily chosen) elements.

so $k = 2A+1$, $A \in \mathbb{Z}$

$m = 2B$, $B \in \mathbb{Z}$

$k^2 + m^2 = (2A+1)^2 + (2B)^2$

$= 4A^2 + 4A + 1 + 4B^2$

$= 2(2A^2 + 2A + 2B^2) + 1$

let $X = 2A^2 + 2A + 2B^2 = 2(A^2 + A + B^2)$

$2A^2$ is integer because it multipe of integers

$2A$ is integer because it multipe of integers

$2B^2$ is integer because it multipe of integers

X is integer because it is sum of integers

so

$k^2 + m^2 = 2X + 1$, $X \in \mathbb{Z}$

so $k^2 + m^2$ is odd

and this is what we want to show

$\Leftarrow$