Cairo University
Faculty of science
Mathematics Department
30 min.

Mid Term 2 Exam(Spring 2019)
Artificial Intelligence
(Comp408)

Name:---------- ID: ----------

Q1) Represent the following sentences in first-order logic

NOTE: the following translation is not unique

a. There are exactly two students studying A.I.
$\exists x \exists y\ std(x) \wedge study(x,AI) \wedge std(y) \wedge study(y,AI) \wedge \neg (x=y) \wedge (\forall z)\ (\ std(z) \wedge study(z,AI) \rightarrow z=x \vee z=y)$

b. There was no student who finishes every exam
$\forall s \exists e\ Std(s) \rightarrow [\ exam(e) \wedge \neg finish(s, e)\ ]$

c. For every quiz, there is a student who finish it."
$\forall q \exists s\ Quiz(q) \rightarrow [\ Student(s) \wedge finish(s, q)\ ]$

d. Everyone has a favorite food."
$\forall x \exists y\ Person(x) \rightarrow [\ Food(y) \wedge Favorite(y, x)\ ]$

e. Every person likes every food.
$\forall x\ \forall y\ [\ Person(x) \wedge Food(y)\ ] \Rightarrow Likes(x, y)$

f. "There is a person who likes every food."
$\exists x\ \forall y\ Person(x) \wedge [Food(y) \Rightarrow Likes(x, y)\ ]$

Q2) Put in the CNF Form B

a. $A \wedge B \Rightarrow C$

Ans: $\neg A \vee \neg B \vee C$

b. $\exists y\ course(x) \wedge std(y) \Rightarrow pass(y,x)$

Ans: $\neg course(x) \vee \neg std(F(x)) \vee pass(F(x),x)$

Best Wishes
Areeg Abdalla