



## (c) [3 marks] Logic.

Let  $A$  be the set of all animals. We define the following predicates:

$IsCute(a)$  : "a is cute", where  $a \in A$

$CanFly(a)$  : "a can fly", where  $a \in A$

$Eats(a, b)$  : "a eats b", where  $a, b \in A$

Translate each of the following statements from symbolic logic into English or vice versa.

(i)  $\exists a \in A, IsCute(a) \vee CanFly(a)$

*At least one animal is either cute or it can fly.*

(ii) No animal that can fly is cute.

*$\forall a \in A, CanFly(a) \Rightarrow \neg IsCute(a)$*

(iii) Every animal that can fly eats at least one animal. (The animal eaten can be different for each flying animal.)

*$\forall a \in A \quad \exists b \in A, CanFly(a) \Rightarrow Eats(a, b)$*