Answers for Semantics Workshop 3

Q2

(i) The set of all entities y such that Jo liked y and Ethel didn't like y.

(ii) The set of all entities z such that z gave the cake to themselves.

(iii) The set of all entities x that are identical to Jo.

(iv) The set of all entities z such that z is a student and z liked Jo.

Q3

(i) λy [(like(y))(jo) & ~((like(y))(ethel))] (the-dog)

>> (like(the-dog))(jo) & ~((like(the-dog))(ethel))

(ii) λz [(give(z)(the-cat))(z)] (bertie)

>> (give(bertie)(the-cat))(bertie)

(iii) λx [~(x = jo)] (bertie)

>> ~(bertie = jo)

(iv) λy [(like(the-cat))(y) ∨ ~(like(the-dog))(y)] (bertie)

>> (like(the-cat))(bertie) ∨ ~(like(the-dog))(bertie))

(v) λx [λy [crazy(x) & (like(x))(y)] (jo) ∨ ~(crazy(x))] (bertie)

>> crazy(bertie) & (like(bertie))(jo) ∨ ~(crazy(bertie))

Q4

(i) λx [(kick(x))(x)] (jo)

>> (kick(x))(jo)

Wrong – every variable x should be replaced by jo

Should be (kick(jo))(jo)

(ii) λx [λx [howl(x)] (the-cat)] (the-dog)

>> λx [howl(the-dog)] (the-cat)

Wrong – same variable is bound by two instances of lambda, one should be replaced by a different variable eg y ALSO, there is only one instance of a variable in the formula – there is nothing for the second lambda expression to convert

(iii) λy [(like(jo))(x)] (bertie)

>> (like(jo))(bertie)

Wrong – can't convert by replacing x with bertie as the variable bound by lambda is not x but y; variables need to be the same for conversion to take place

(iv) λz [crazy(z)] (ethel) ∨ drunk(z)

>> crazy(ethel) ∨ drunk(ethel)

Wrong – second open formula is not within the scope of the lambda operator and can't be converted, needs to be λz [crazy(z) ∨ drunk(z)] (ethel) **to get the desired result**

Q5

i.	λR [(R(jo'))(bertie')].	<<e,<e,t>>,t>
ii.	λP [λA [A(P)]].	<<e,t>,<<<e,t>,<e,t>>,<e,t>>>
iii.	λQ [Q(ethel')].	<<e,t>,t>
iv.	λx [λy [λz [(give'(x)(y))(z)]]].	<e,<e,<e,t>>>
v.	λp [p ↔ rain'].	<t,t>
vi.	λp [λq [p ↔ q]].	<t,<t,t>>