1. What’s the definition of mad\_cow? Give both the formal definition and an

explanation in your own words.

Formal Definition :

∀ x ∃ y cow(x) ∧ sheep(y) ∧ part\_of(brain(y),y) ∧ eats (x,brain(y)) ⇔ mad\_cow(x)

Here brain(y) returns brain of y.(By Skolemization).

Explanation in own words :

The “mad cow” is a subclass of class “cow” and also it should eat class “brain”, which is a part of class “sheep”.

2)What constraints does mad\_cow inherit from its superclasses?

mad\_cow >> cow >> vegetarian >> animal >> thing

From animal : eats some “thing”(class)

From vegetarian : (eats only (not (animal))) and (eats only(not (part\_of some animal)))

From cow :

3) Do you see any problem with that definition? Why?

Yeah, there is a problem with the definition because mad\_cow eats brains of sheep. But cow being subclass of vegetarian class, it is supposed to eat only(not (animal) and not part\_of some (animal)).

4)What happened to the definition of mad\_cow?

The definition is changed. Now mad\_cow does not have any super class.

5. What happened to the giraffe class? Why?

<owl:Class rdf:about="http://owl.man.ac.uk/2006/07/sssw/people#giraffe">

<rdfs:subClassOf>

<owl:Restriction>

<owl:allValuesFrom>

<owl:Class rdf:about="http://owl.man.ac.uk/2006/07/sssw/people#leaf"/>

</owl:allValuesFrom>

<owl:onProperty>

<owl:ObjectProperty rdf:about="http://owl.man.ac.uk/2006/07/sssw/people#eats"/>

</owl:onProperty>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"

></rdfs:comment>

<rdfs:subClassOf rdf:resource="http://owl.man.ac.uk/2006/07/sssw/people#animal"/>

<rdfs:label rdf:datatype="http://www.w3.org/2001/XMLSchema#string"

>giraffe</rdfs:label>

</owl:Class>

From the definition of “giraffe” class, we know that whatever giraffe eats is “leaf” and leaf is not animal and not part\_of (animal), which is the definition of vegetarian class.

Giraffe became a subclass of **vegetarian class**.

6. List all the person instances.

Walt

Fred

Joe

Kevin

Pete

Mick

Minnie

7.Give a complete description of the instance Mick.

rdfs:comment <http://owl.man.ac.uk/2006/07/sssw/people#Mick> "Mick is male and drives a white van. "^^xsd:string)

rdfs:label <http://owl.man.ac.uk/2006/07/sssw/people#Mick> "Mick"^^xsd:string

SubClassOf( <<http://owl.man.ac.uk/2006/07/sssw/people#Mick>>

<http://owl.man.ac.uk/2006/07/sssw/people#male> )

<http://owl.man.ac.uk/2006/07/sssw/people#drives> <http://owl.man.ac.uk/2006/07/sssw/people#Mick> <http://owl.man.ac.uk/2006/ 07/sssw/people#Q123\_ABC>

<http://owl.man.ac.uk/2006/07/sssw/people#reads> <http://owl.man.ac.uk/2006/07/sssw/people#Mick> <<http://owl.man.ac.uk/2006/07/sssw/people#Daily_Mirror>>

<http://owl.man.ac.uk/2006/07/sssw/people#is\_pet\_of> <http://owl.man.ac.uk/2006/07/sssw/people#Rex> <<http://owl.man.ac.uk/2006/07/sssw/people#Mick>>

**DifferentIndividuals**

(<http://owl.man.ac.uk/2006/07/sssw/people#Dewey> <http://owl.man.ac.uk/2006/07/sssw/people#Fido> <http://owl.man.ac.uk/2006/07/ sssw/people#Flossie> <http://owl.man.ac.uk/2006/07/sssw/people#Fluffy> <http://owl.man.ac.uk/2006/07/sssw/people#Fred> <http://owl.man.ac.uk/2006/07/ sssw/people#Huey> <http://owl.man.ac.uk/2006/07/sssw/people#Joe> <http://owl.man.ac.uk/2006/07/sssw/people#Kevin> <http://owl.man.ac.uk/2006/07/sssw/ people#Louie> <**http://owl.man.ac.uk/2006/07/sssw/people#Mick**> <http://owl.man.ac.uk/2006/07/sssw/people#Minnie> <http://owl.man.ac.uk/2006/07/sssw/ people#Q123\_ABC> <http://owl.man.ac.uk/2006/07/sssw/people#Rex> <http://owl.man.ac.uk/2006/07/sssw/people#The\_Guardian> <http://owl.man.ac.uk/2006/07/ sssw/people#The\_Sun> <http://owl.man.ac.uk/2006/07/sssw/people#The\_Times> <http://owl.man.ac.uk/2006/07/sssw/people#Tibbs> <http://owl.man.ac.uk/2006/ 07/sssw/people#Walt>)

8. List all the descendant classes of pet owner

animal lover

cat owner

dog owner

mad cow

old lady

nothing

9. How many “pets” must a person have to be considered an animal-lover?

Minimum of 3

10. Do all the “pets” of an animal-lover need to be animals?

No, the pets have to be “things” and things need not be only animals.