Attempt Score	81 out of 100 points
Time Elapsed	45 minutes out of 50 minutes

Question 1

Let us consider the following statements:

```
ex:locatedInRegion rdfs:domain ex:City .

ex:locatedInRegion rdfs:range ex:Region .
```

State if the following is true or false: "*A city can be only located in a region*".

Selected Answer: ✗ False

Answers: ✓ True

False

Question 2

In the definition of ontology what does the term "shared" means?

Selected Answer: ✓ The ontology captures consensual knowledge that not private to an individual but shared by a group.

Answers: ✓ The ontology captures consensual knowledge that not private to an individual but shared by a group.

An ontology is used to share details of the architecture of the systems using it.

An ontology is shared if it is enforced through mappings on different applications.

An ontology is shared when an application shares through some communication mechansim.

Question 3

Given the following ontology fragment:

```
:Professor rdfs:subClassOf :AcademicStaffMember .
:FirstYearModule
     rdf:type owl:Class ;
     owl:equivalentClass owl:intersectionOf (:Module
                         [ rdf:type owl:Restriction
                         owl:onProperty :isTaughtBy ;
                         owl:someValuesFrom :Professor ]) .
```

Decide which of the following options is true.

Selected Answer: ✓ 1. A first year module can be taught by at least one professor and possibly others.

Answers: ✓ 1. A first year module can be taught by at least one professor and possibly others.

2. A first year module can be taught by more than one academic staff member.

3. A first year module can be taught by only one academic staff member.

4. Someone who is not a professor can teach a first year module on their own.

Question 4

Let us consider the following fragment in OWL:

```
ex:HighMountain rdfs:subClassOf [
   rdf:type owl:Restriction ;
   owl:onProperty ex:hasHeightInMeters ;
   owl:minCardinality "5000"^^xsd:int
].
```

Is this fragment modelling the fact that a HighMountain is a mountain that is at least 5000mt high?

Selected Answer: ✗ Yes
Answers: Yes
✓ No

Question 5

Given the following OWL fragment:

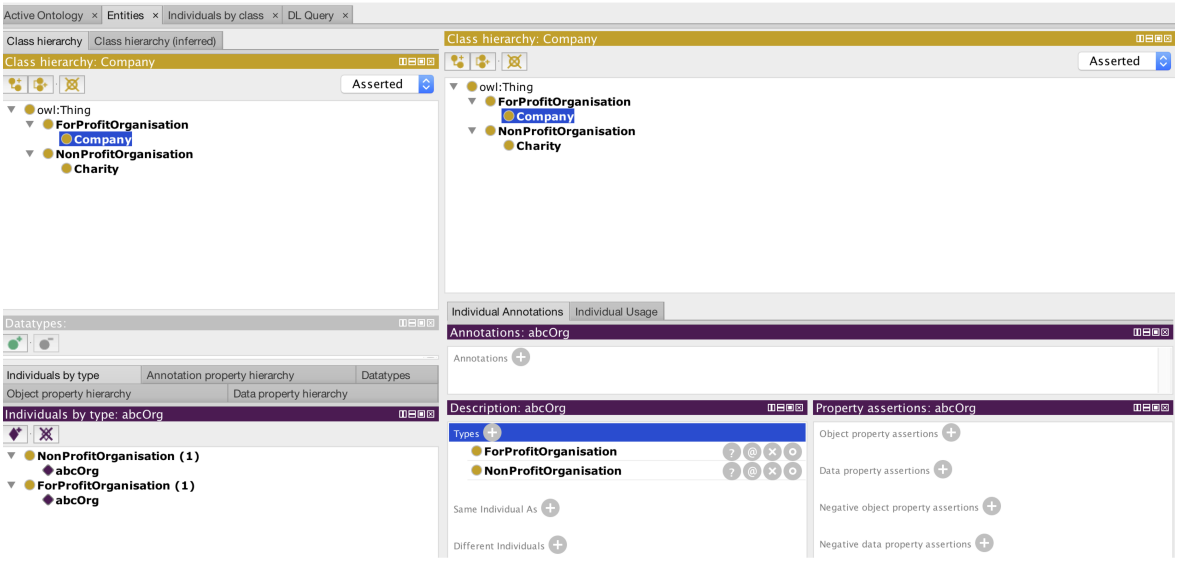
```
ex:Region owl:equivalentClass [
   owl:unionOf ( ex:Mountain ex:City)
].
ex:MontBlanc rdf:type ex:Mountain .
ex:Savoie rdf:type ex:Region .
```

State the whether the following statement is true: " Savoie is definitely a Mountain".

Selected Answer: ✓ False
Answers: True
✓ False

Question 6

Select the statement that correctly represents the ontological fragment depicted below.



Selected Answer: abcOrg is a valid individual since there is no disjointness axiom stating that the intersection between NonProfitOrganisation and ForProfitOrganisation should be empty.

Answers: abcOrg is a valid individual since there is no disjointness axiom stating that the intersection between NonProfitOrganisation and ForProfitOrganisation should be empty.

abcOrg can only be a valid individual of one class only, it cannot be an instance of NonProfitOrganisation and ForProfitOrganisation at the same time.

abcOrg belongs to the union between NonProfitOrganisation and ForProfitOrganisation, therefore the model is correct.

In order for abcOrg to be both an individual for NonProfitOrganisation and for ForProfitOrganisation the two classes need to be declared disjoint.

Question 7

Let us consider the following statements:

```
ex:locatedInRegion rdfs:domain ex:City .
ex:locatedInRegion rdfs:range ex:Region .
```

The element `ex:locatedInRegion` defines:

Selected Answer: 4. An object property

Answers:
1. A class
2. A restriction
3. An datatype property
4. An object property

Question 8

Given the following OWL fragment:

```
 ex:AlpineMountain rdfs:subClassOf [
    rdf:type owl:Restriction ;
    owl:onProperty ex:locatedInRegion ;
    owl:someValueFrom ex:AlpineRegion ;
].

ex:AlpineMountain rdfs:subClassOf [

    rdf:type owl:Restriction ;
    owl:onProperty ex:locatedInRegion ;
    owl:minCardinality "1"^^xs:nonNegativeInteger ;

].
```

State if the following sentence is true. "*The cardinality restriction in this fragment is necessary, we wouldn't be able to express the fact that al Alpine Region is located in a Region of this sentence without the cardinality restriction"*.

Selected Answer: ✓ False
Answers: True
✓ False

Question 9

Given the following ontology fragment:

```
:FirstYearModule rdfs:subClassOf :Module .
:Professor rdfs:subClassOf :AcademicStaffMember .
:isTaughtBy rdfs:domain :Module;
            rdfs:range  :AcademicStaffMember .

:FirstYearModule
     rdf:type owl:Class ;
     rdfs:subClassOf [ rdf:type owl:Restriction
                         owl:onProperty :isTaughtBy ;
                         owl:someValuesFrom :Professor ] .
```

Decide if the following statement is true: "*A professor can teach a second year module*".

Selected Answer: ✓ True
Answers: ✓ True
False

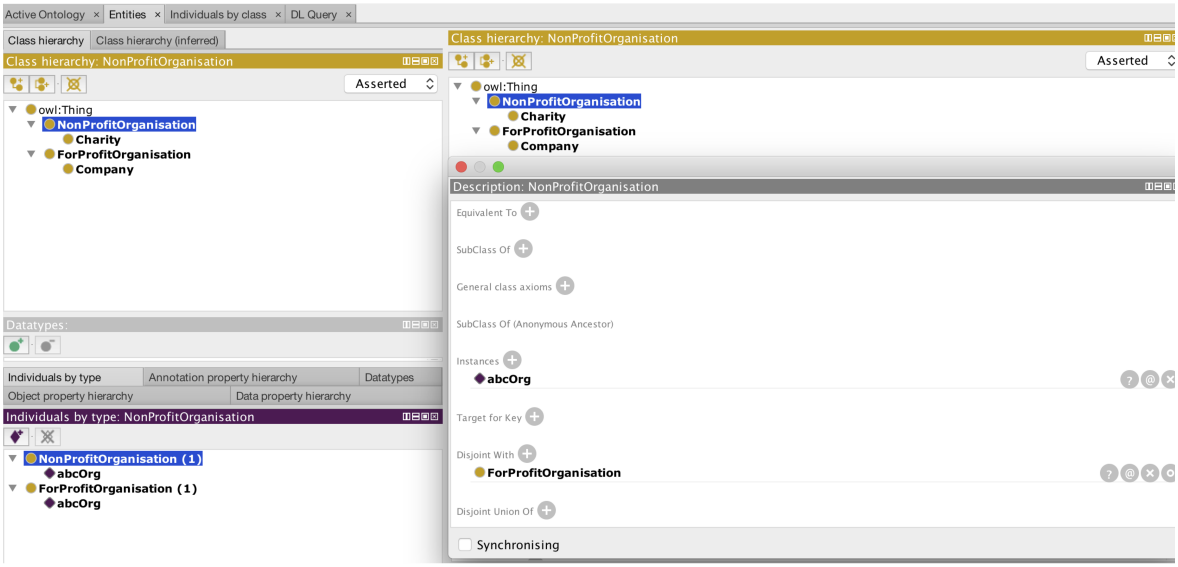
Question 10

Let us assume you need to model the property `:hasHusband`, with domain `:Person` and range `:Person`. Decide which of the following property characteristics would correctly describe the property.

Selected Answer: ✓ 1. `:hasHusband` is functional.
Answers: ✓ 1. `:hasHusband` is functional.
2. `:hasHusband` is reflexive.
3. `:hasHusband` is transitive.
4. `:hasHusband` is anti-symmetric.

Question 11

Let us consider the ontology in the picture. Is abcOrg a valid individual?



Selected Answer: ✔ False

Answers: True

✔ False

Question 12

Given the following ontology fragment:

```
:FirstYearModule
     rdf:type owl:Class ;
     rdfs:equivalentClass [  rdf:type owl:Restriction
                             owl:onProperty :isTaughtBy ;
                             owl:allValuesFrom :Professor ] .
```

Decide whether the it is true that a first year module can be taught by someone other than a professor (i.e. who is not a professor).

Selected Answer: ✔ False

Answers: True

✔ False

Question 13

What kind of OWL construct would you use to express the fact that "if C is a class, and r is a property, all objects connected with the given property r must be instances of the class C".

Selected Answer: ✔ 2. `owl:allValuesFrom C`

Answers: 1. `owl:hasValueFrom C`

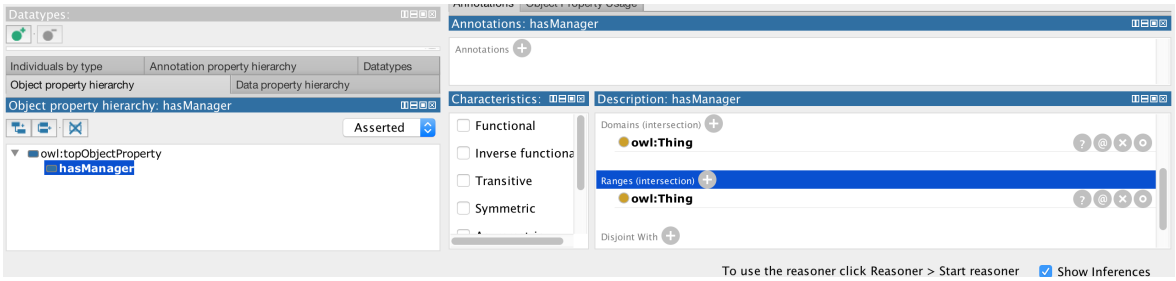
✔ 2. `owl:allValuesFrom C`

3. `owl:EquivalentClass C`

4. `owl:someValuesFrom C`

Question 14

Given the object property defined as in the picture, decide which of the following options accurately describes the model:



Selected Answer: The object property in the picture is syntactically correct, but it could cause unwanted misclassification when the inferred model is computed

Answers: The object property in the picture is appropriately defined, and will not lead to misclassification errors.

The object property is incorrectly defined, it needs the definition of domain and range, existential and universal restrictions.

The object property in the picture is syntactically correct, but it could cause unwanted misclassification when the inferred model is computed

The object property in the picture is syntactically incorrect, but it could not affect the computation of the inferred model by a reasoner.

Question 15

In the definition of ontology, the term "formal" refers to the fact that the ontology should be:

Selected Answer: 3. Expressed in a machine readable format

Answers:
1. Syntactically and semantically correct
2. Expressed in Description Logic
3. Expressed in a machine readable format
4. Should be founded on formal ontological analysis

Question 16

Given the following OWL fragment:

```
ex:AlpineRegion owl:equivalentClass [
   owl:intersectionOf ( ex:MountainRegion ex:LakeRegion)
].
ex:MontBlanc rdf:type ex:Mountain .
ex:Savoie rdf:type ex:AlpineRegion .
```

State whether Savoie is a Mountain Region.

Selected Answer: True

Answers: True
False

Question 17

What kind of OWL construct would you use to express the fact that "if C is a class, and r is a property, there must be at least one object connected with the given property r that is an instance of the class C"

Selected Answer: ✓ 3. `owl:someValuesFrom C`

Answers:
1. `owl:functionalProperty r`
2. `owl:hasValueFrom C`
✓ 3. `owl:someValuesFrom C`
4. `owl:allValuesFrom C`

Question 18

Given the following OWL fragment:

```
ex:Region owl:equivalentClass [
   owl:unionOf ( ex:Mountain ex:City)
].
ex:MontBlanc rdf:type ex:Mountain .
ex:Savoie rdf:type ex:Region .
```

Is the statement "MontBlanc is a Region" right?

Selected Answer: ✓ Right

Answers:
✓ Right
Wrong

Question 19

Does `A owl:differentFrom B` state that A and B are classes and that no instance of A can be an instance of B at the same time?

Selected Answer: ✓ False

Answers:
True
✓ False

Question 20

Decide which of the following OWL fragments is a translation of the statement:
"*An actor is either a theatre actor or a movie star*"

Selected Answer:
```
Actor owl:EquivalentClass [
   rdf:type owl:Class ;
   owl:oneOf (:TheatreActor :MovieStar)
] .
```
✗ 4.

Answers:
```
Actor owl:EquivalentClass [
   rdf:type owl:Class ;
   owl:unionOf (:TheatreActor :MovieStar)
] .
```
✓ 1.

```
Actor owl:EquivalentClass [
   rdf:type owl:Class ;
   owl:intersectionOf (:TheatreActor :MovieStar)
] .
```

2.

```
Actor owl:EquivalentClass [
   rdf:type owl:Class ;
   owl:complementOf (:TheatreActor :MovieStar)
] .
```

3.

```
Actor owl:EquivalentClass [
   rdf:type owl:Class ;
   owl:oneOf (:TheatreActor :MovieStar)
] .
```

4.

Question 21

The methodology for building ontologies presented during the lectures includes several phases. What are the activities that are carried out during the phase that allows the scoping of the ontology?

Selected Answer: Scoping the ontology involves the definition of competency questions, these are questions that the ontology based application that is being built should be able to answer.

Answers: Scoping the ontology involves the definition of competency questions, these are questions that the ontology based application that is being built should be able to answer.

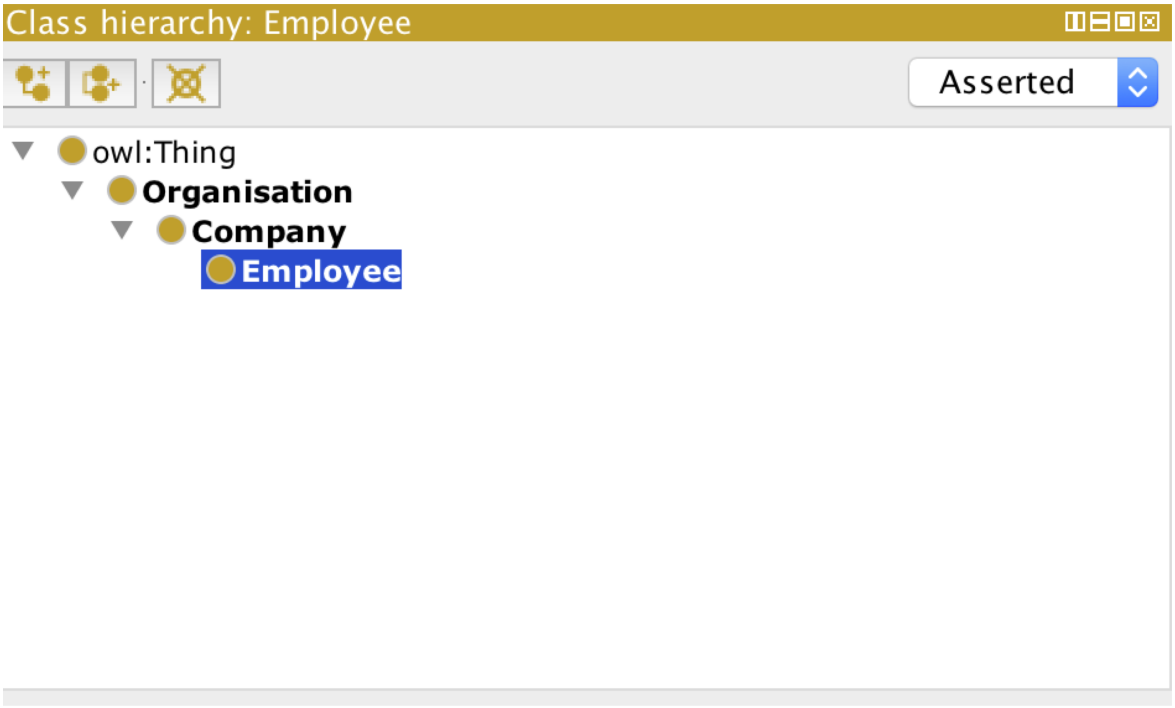
Scoping the ontology involves carrying out requirement, domain and use case analysis to identify any architectural issues that might arise.

Scoping the ontology involves checking for anomalies, which typically involves running a reasoner to ensure that the ontology being built is consistent and coherent.

Scoping the ontology involves defining the constraints that allow the knowledge engineer to model complex concepts.

Question 22

Let us consider the class hierarchy illustrated in the picture. Is the class Employee correctly modelled?



Selected Answer: False
Answers: True
False

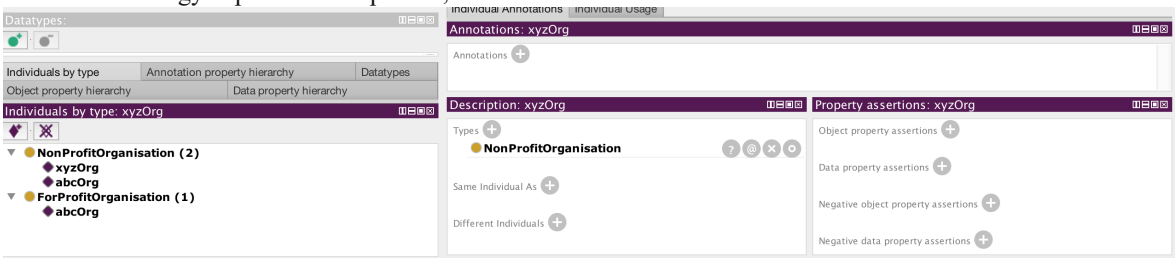
Question 23

Decide if the following statement is true or false.
"`A owl:sameAs B` *is part of the OWL vocabulary and expresses that* `A` *and* `B` *are the same instance*"

Selected Answer: False
Answers: True
False

Question 24

Given the ontology depicted in the picture, select the correct statement.



Selected Answer: 2.
The individual xyzOrg is not the same individual as abcOrg. Hence, the two classes have the definitely different instances.

Answers: 1.
The individual xyzOrg might be different from or could be the same individual as abcOrg, given that the declaration of owl:sameAs and owl:differentFrom are not stated.

2.

The individual xyzOrg is not the same individual as abcOrg. Hence, the two classes have the definitely different instances.

3.
The classes only have one common individual, abcOrg, that belongs both to ForProfitOrganisation and to NonProfitOrganisation.

4.
The model in the picture is incorrect because an individual cannot belong to two classes at the same time.

Question 25

Is an ontology an explicit specification of a shared conceptualisation?

Selected Answer: ✔ True
Answers: ✔ True
False

Question 26

What kind of OWL construct would you use to express the fact that "if r is a property and x is an instance, there must be at least one connection with the given property that has as its object x"

Selected Answer: ✔ 4. `owl:hasValue x`
Answers: 1. `owl:someValuesFrom x`
2. `owl:allValuesFrom x`
3. `owl:functionalProperty x`
✔ 4. `owl:hasValue x`

Wednesday, 29 May 2019 21:46:54 o'clock BST

← OK