

i Exam Information

- The exam is composed by 7 sections
- There are not optional sections, you should answer all sections
- Section 1 and 2 can be done on Scantron sheets
- Incorrect answer in the quiz are penalized, but the questions that you don't answer will not get penalized.
- You have 3 hours to solve the exam

GOOD LUCK!

i Ontology modelling information

- You can model the ontology in a separate sheet (Scantron)
- In order to get the full grading for this question you should use OWL and OWL2 vocabulary and OWL complex classes. There are other possible solutions which are correct but don't give the full grading.

1 Ontology modelling

We need to model an ontology about persons with the following requirements: The Person class is composed by all men and women. A man cannot be at the same time a woman, and a woman cannot be at the same time a man. Any Person can have a child which must be another different person than itself and no two persons can be each others child.

- To get the full grading of this exercise, you should use the suitable OWL and OWL2 vocabularies when needed

You can use the following prefixes:

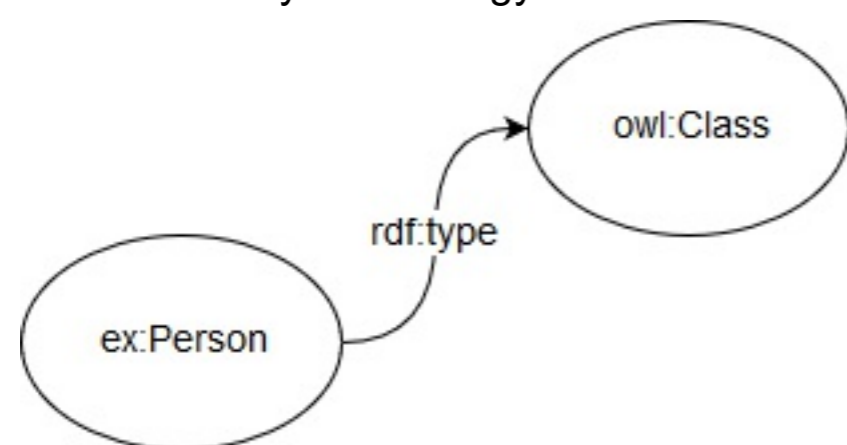
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#>

@prefix owl: <http://www.w3.org/2002/07/owl#>

@prefix ex: <http://www.example.org/examINFO216# >

You can start your ontology with:



Fill in your answer here

Format
-
B
I
U
 x_2
 x^2
 I_x
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📂
↶
↷
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☰
☷
Ω
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✎
Σ
✖

Words: 0

Maximum marks: 30

i **RDF/XML information**

- You can draw the ontology in a separate sheet (Scantron)

2 Draw the output graph of the following RDF/XML data model

Draw the output graph of the following RDF/XML data model:

```
<?xml version="1.0"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:uib="http://www.example.org/foo/uib#"
  <rdf:Description rdf:about="http://www.example.org/foo/uib#Trude">
    <uib:workplace>
      <rdf:Description rdf:about="http://www.example.org/foo/uib#SVF">
        <uib:belongs_to>
          <rdf:Description rdf:about="http://www.example.org/foo/uib#UiB"/>
        </uib:belongs_to>
      </rdf:Description>
    </uib:workplace>
  </rdf:Description>
  <uib:workplace>
    <rdf:Description rdf:about="http://www.example.org/foo/uib#MCB">
      <uib:belongs_to>
        <rdf:Description rdf:about="http://www.example.org/foo/uib#UiB"/>
      </uib:belongs_to>
    </rdf:Description>
  </uib:workplace>
</rdf:Description>
  <rdf:Description rdf:about="http://www.example.org/foo/uib#Marie">
    <uib:workplace>
      <rdf:Description rdf:about="http://www.example.org/foo/uib#SVF"/>
    </uib:workplace>
  </rdf:Description>
  <rdf:Description rdf:about="http://www.example.org/foo/uib#UiB">
    <uib:has_faculty>
      <rdf:Description rdf:about="http://www.example.org/foo/uib#SVF"/>
    </uib:has_faculty>
  </rdf:Description>
  <rdf:Description rdf:about="http://www.example.org/foo/uib#Marie">
    <uib:salary rdf:parseType="Resource">
      <uib:quantity rdf:datatype="http://www.w3.org/2001/XMLSchema#int">400000</uib:quantity>
      <uib:period>
        <rdf:Description rdf:about="http://www.example.org/foo/uib#Annualy"/>
      </uib:period>
    </uib:salary>
  </rdf:Description>
</rdf:RDF>
```

Fill in your answer here

Format
B
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x₂
x²
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☰
☷
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✎
Σ
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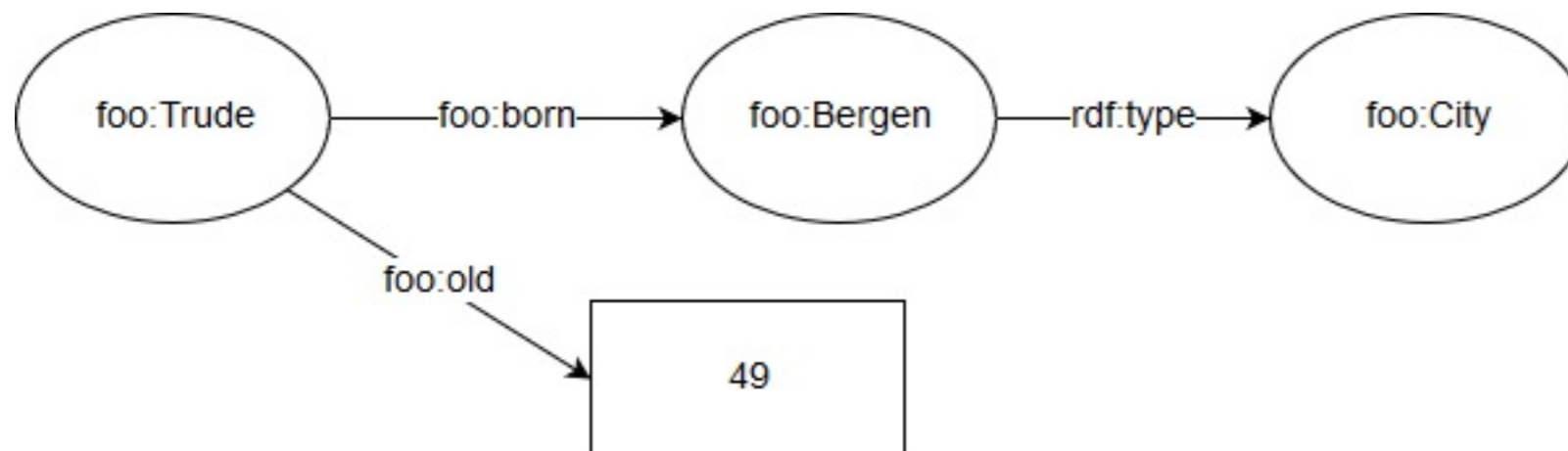
Words: 0

Maximum marks: 15

3 **Write the triples from the following ontology, taking into consideration the data type when needed**

Write the triples (subject predicate object) from the following ontology, taking into consideration the data type when needed (you can make a table for that) :

You can use the prefix xsd for <http://www.w3.org/2001/XMLSchema#>



Fill in your answer here

Format - | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | | |

Words: 0

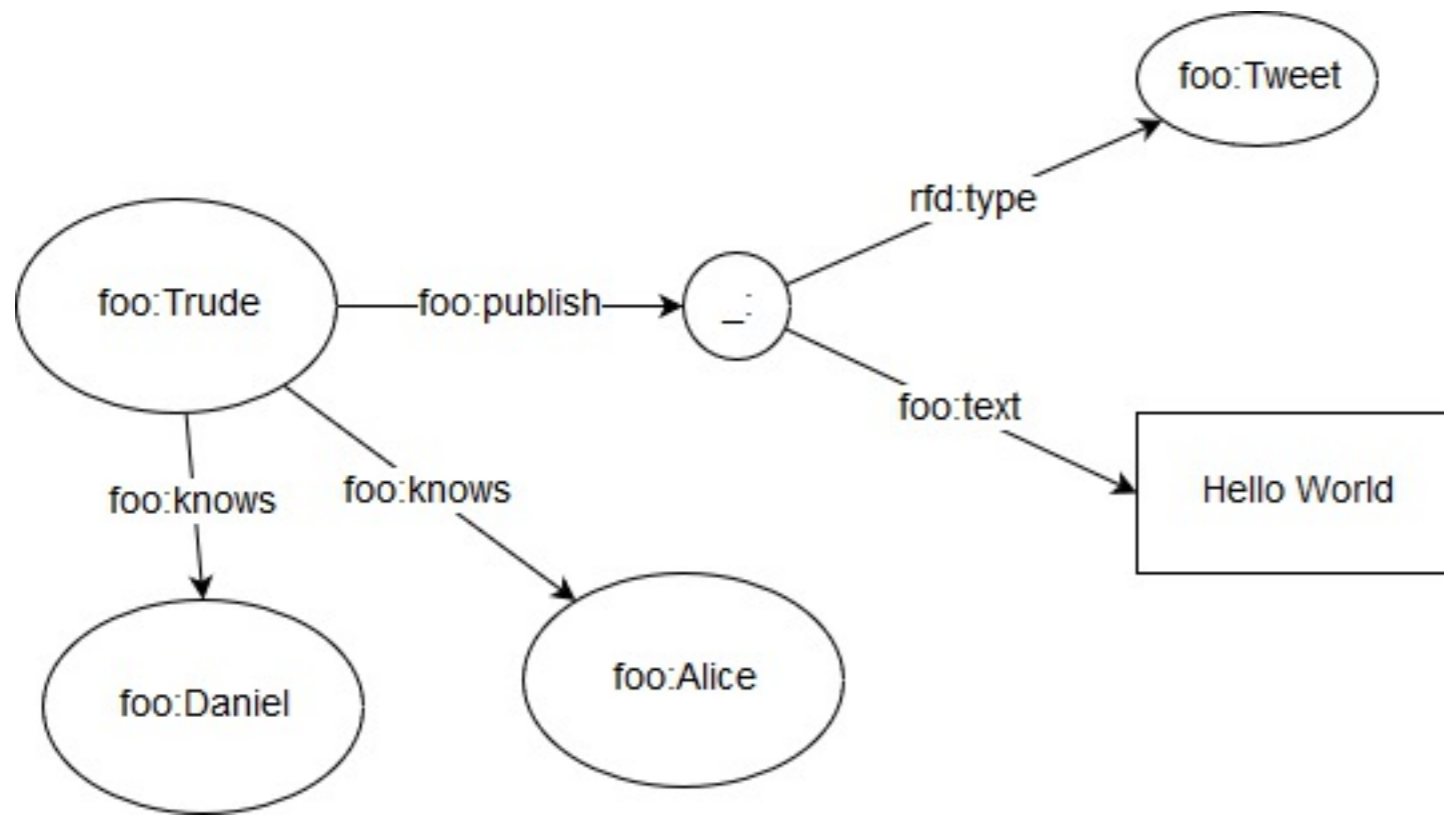
Maximum marks: 10

4 Represent in TURTLE notation the following ontology

Represent in TURTLE notation the following ontology:

@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .

@prefix foo: <http://www.example.org/foo#> .



Fill in your answer here

Format
-
B
I
U
 x_2
 x^2
 I_x
📄
📁
↶
↷
🔄
☰
☷
Ω
🔍
Σ
✖

Words: 0

Maximum marks: 10

5 Transform the following JSON-LD into its expansion form

```
{
  "@context": {
    "name": "http://xmlns.com/foaf/0.1/name",
    "birthPlace": {
      "@id": "https://schema.org/birthPlace",
      "@type": "https://schema.org/Place"
    }
  },
  "@id": "https://www.wikidata.org/wiki/Q80621",
  "name": "Edvard Grieg",
  "birthPlace": {"@id": "http://dbpedia.org/resource/Bergen"}
}
```

Transform the following JSON-LD into its expansion form:

Fill in your answer here

1	
---	--

Maximum marks: 5

i Use the Manchester OWL-syntax to represent the following assertions

Use the Manchester OWL-syntax to represent the following assertions:

6 A Teaching Assistant is both student and teacher

A Teaching Assistant is both student and teacher

Fill in your answer here

Maximum marks: 2

7 A Single person is a person which has not a relationship

A Single person is a person which doesn't have a relationship

Fill in your answer here

Maximum marks: 2

8 A Big Family is a family that has 3 childrens or more

A Big Family is a family that has 3 children or more.

Fill in your answer here

Maximum marks: 2

9 A passed course is a course that has all its assignments passed

A passed course is a course that has all its assignments passed

Fill in your answer here

Maximum marks: 2

10 A kitten is a cat which is the baby of a cat

A kitten is a cat which is the baby of a cat.

Fill in your answer here

Maximum marks: 2

i Information about the Quiz

- The Quiz is composed by 40 questions
- You don't need to answer all the questions
- Each incorrect answer is penalized by $-\left(questionValue * \frac{1}{numberOfOptions-1} \right)$
- The questions you don't answer are not penalized
- **There is only one correct answer**
- Most of the questions have 3 options, except some of them which have only 2 options
- There is a few group of questions where you have to choose the incorrect answer (it is stated in the question).

11 Who is the inventor of the World Wide Web?

Who is the inventor of the World Wide Web?

Select one alternative:

- Steve Wozniak
- Timothy John Berners-Lee
- John von Neumann

Maximum marks: 0.5

12 **What does AAA stand for?**

What does **AAA** stand for?

Select one alternative:

- anyone can add anything about any topic
- anyone can say anything about any topic
- anyone can link anything about any topic

Maximum marks: 0.5

13 **What does the Nonunique Naming Assumption mean?**

What does the Nonunique Naming Assumption mean?

Select one alternative:

- The same Web resource is always referred to using the same name by different people.
- We have to assume that some Web resource might be referred to using different names by different people.
- URI cannot be used for referring to Web resources.

Maximum marks: 0.5

14 **According to the Open world assumption. Can we draw conclusions that rely on assuming that the information available at any one point is all the information available?**

According to the Open world assumption. Can we draw conclusions that rely on assuming that the information available at any one point is all the information available?

Select one alternative:

- Dependent on the sources: if they are trusted sources, then we can draw conclusions
- No, we may not.
- Yes, if we use the information available at that point.

Maximum marks: 0.5

15 **Which is the difference between URI and IRI?**

Which is the difference between URI and IRI?

Select one alternative:

- There is no difference
- URI only covers IMAP URLs and IRI can cover more resources than IMAP URLs
- URI uses ASCII and IRI uses Unicode

Maximum marks: 0.5

16 **About blank nodes (select the incorrect one)**

About blank nodes (**select the incorrect one**)

Select one alternative:

- Blank nodes can have local identifier
- Some blank nodes have no IRI
- Blank nodes are supported by all RDF technologies

Maximum marks: 0.5

17 **About Qnames (select the incorrect one)**

About Qnames (**select the incorrect one**)

Select one alternative:

- A QName is the general term for IRI and URI.
- A QName has two parts: a namespace and an identifier.
- A QName is a simplified version of an IRI abbreviation scheme

Maximum marks: 0.5

18 **TBOX are**

TBOX are:

Select one alternative:

- The statements that describe a domain of interest
- The facts associated with a conceptual model
- The ontologies associated within a knowledge base

Maximum marks: 0.5

19 **ABOX are**

ABOX are:

Select one alternative:

- The statements that describe a domain of interest.
- The classes and properties defined as a domain vocabulary
- The ontologies associated within a knowledge base

Maximum marks: 0.5

20 **About RDFS**

About RDFS:

Select one alternative:

- RDFS stands for RDF Serialization.
- RDFS is a subset of RDF vocabulary.
- RDFS is a general-purpose language for representing simple RDF vocabularies.

Maximum marks: 0.5

21 About OWL

About OWL:

Select one alternative:

- OWL includes OWL2, OWL Lite, OWL DL, and OWL DN
- OWL stands for Web Ontology Language
- OWL is a sublanguage of RDFS

Maximum marks: 0.5

22 About SKOS

About SKOS:

Select one alternative:

- SKOS vocabulary is not compatible with RDF
- SKOS is a general-purpose vocabulary
- SKOS is a common data model for sharing and linking simple knowledge organization systems

Maximum marks: 0.5

23 Which are rdf:Container?

Which are rdf:Container?

Select one alternative:

- Rdf:List, rdf:Bag, rdf:Set
- Rdf:Bag, rdf:Alt, rdf:Seq
- Rdf:Alt, rdf:Set, rdf:List

Maximum marks: 0.5

24 **Which properties belongs to rdf:List**

Which properties belongs to rdf:List?

Select one alternative:

- Rdf:_1, rdf:_2, rdf:_3
- Rdf:rest, rdf:first, rdf:nil
- Rdf:first, rdf:last, rdf:nil

Maximum marks: 0.5

25 **What does the “lifting” process?**

What does the “lifting” process do?

Select one alternative:

- Lifting retrieves RDF triples from tagged resources
- Lifting makes less structured data locally available in well-structured format
- Lifting makes structured data semantic

Maximum marks: 0.5

26 **In RDFS which property is used for further information**

In RDFS which property is used for further information?

Select one alternative:

- Rdfs:label
- Rdfs:comment
- Rdfs:seeAlso

Maximum marks: 0.5

27 **In the following expression: ex:Person ex:hasPassportNumber ex:PassportNumber**

In the following expression: ex:Person ex:hasPassportNumber ex:PassportNumber

Select one alternative:

- The domain of the property hasPassportNumber is PassportNumber
- The range of the property hasPassportNumber is PassportNumber
- The range of the property hasPassportNumber is Person

Maximum marks: 0.5

28 **Taking into account that ex:Person has the property ex:hasDriversLicense and ex:Child is rdfs:SubClassOf ex:Person**

Taking into account that ex:Person has the property ex:hasDriversLicense and ex:Child is rdfs:SubClassOf ex:Person

Select one alternative:

- A Child doesn't have the same properties of a Person
- A Child is not a Person
- A Child can have a Drivers Licence

Maximum marks: 0.5

29 **Which properties are reused in OWL**

Which properties are reused in OWL

Select one alternative:

- Rdf:type, rdfs:subPropertyOf, rdf:Property
- Rdfs:range, rdfs:Resource, rdf:Thing
- Rdf:type, rdf:sameAs, rdfs:domain

Maximum marks: 0.5

30 **Which property are renamed in OWL**

Which property are renamed in OWL?

Select one alternative:

- Rdfs:Resource
- Rdf:type

Maximum marks: 0.5

31 **The property owl:inversOf**

The property owl:inversOf

Select one alternative:

- Owl:inversOf is used for classes that can be each other's reverses
- Owl:inversOf is used for properties that can be each other's reverses

Maximum marks: 0.5

32 **Owl:disjointWith can be used for properties**

Owl:disjointWith can be used for properties

Select one alternative:

- False
- True

Maximum marks: 0.5

33 **The Dublin Core (DC) is used for**

The Dublin Core (DC) is used for:

Select one alternative:

- Describing data privacy policies
- Describing governmental and regional organizations
- Describing web resources and physical resources

Maximum marks: 0.5

34 **FOAF vocabulary is used for (mark the incorrect one)**

FOAF vocabulary is used for **(mark the incorrect one)**

Select one alternative:

- describing things that people can do and social Web sites
- describing peoples emotions and feelings
- describing people, the links between them

Maximum marks: 0.5

35 **VCard vocabulary is used for**

VCard vocabulary is used for

Select one alternative:

- Describing electronic visiting card information
- Describing information in credit cards and Drivers Licence cards
- Describing ID card information

Maximum marks: 0.5

36 **Geo (WGS84) vocabulary is used for**

Geo (WGS84) vocabulary is used

Select one alternative:

- for representing latitude, longitude and altitude
- for representing cities, countries, states, continents, rivers ...
- for representing geology and earth science terms

Maximum marks: 0.5

37 **Data cube vocabulary is used for**

Data cube vocabulary is used

Select one alternative:

- For describing polyandric objects and structures
- for describing statistics and multi-dimensional data
- for describing data about shipping and transactions

Maximum marks: 0.5

38 **VANN vocabulary is**

VANN vocabulary is

Select one alternative:

- a vocabulary for describing visual arts
- a vocabulary for describing rivers, water pipes and hydraulic systems
- a vocabulary for annotating descriptions of vocabularies

Maximum marks: 0.5

39 **Vocabularies BIO, BIBO and MO are design for**

About BIO, BIBO and MO vocabularies:

Select one alternative:

- Both BIO and BIBO describes biographical things and MO is a music ontology
- BIO describes biological concepts, MO describes molecular concepts, BIBO is an extension of BIBO
- BIO describes biography concepts, MO is a music ontology and BIBO describes biographical things

Maximum marks: 0.5

40 **About Wikidata**

About Wikidata

Select one alternative:

- Wikidata contains structured data
- Wikidata is older than DBpedia
- Wikidata is derived from Wikipedia

Maximum marks: 0.5

41 **About DBpedia**

About DBpedia

Select one alternative:

- DBpedia is derived from Wikipedia
- DBpedia can be edited by humans
- DBpedia contains much less information than Wikidata

Maximum marks: 0.5

42 About GeoNames

About GeoNames

Select one alternative:

- GeoNames is designed for defining latitude, longitude and altitude concepts
- GeoNames is designed for representing geospatial information about cities, countries, states, continents, rivers ...
- GeoNames Is a semantic encyclopaedia like Wikipedia for geology terms

Maximum marks: 0.5

43 About WordNet

About WordNet

Select one alternative:

- WordNet is an multilingual translation semantic service
- WordNet is an electronic open-source dictionary
- WordNet is an opensource semantic network for NLP projects

Maximum marks: 0.5

44 Which of the following clauses is not an SPARQL clause

Which of the following clauses is not an SPARQL clause

Select one alternative:

- DESCRIBE
- ASK
- JOIN

Maximum marks: 0.5

- 45 **If we have the following SPARQL sentence and we want to see only those products that give a revenue higher than 20000. Which SPARQL clause do we need to add?**

If we have the following SPARQL sentence and we want to see only those products that give a revenue higher than 20000. Which SPARQL clause do we need to add?

```
SELECT ?product (COUNT(?price) AS ?revenue)
```

```
WHERE {?product ex:hasSold ?price .}
```

```
GROUP BY ?product
```

Select one alternative:

- HAVING (?revenue > 20000)
- WHERE (?revenue > 20000)
- FILTER (?revenue > 20000)

Maximum marks: 0.5

- 46 **We want to know the cities of a given country but we only have the property belongsTo (:City :belongsTo :Country), which SPARQL composite property can we use?**

We want to know the cities of a given country but we only have the property belongsTo (:City :belongsTo :Country), which SPARQL composite property can we use?

Select one alternative:

- :country !:belongsTo ?city .
- :country :belongsTo+ ?city .
- :country ^:belongsTo ?city .

Maximum marks: 0.5

- 47 **We want to know both daughters and sons of any person which has the properties hasDaughter and hasSon, among others, which SPARQL composite property can we use?**

We want to know both daughters and sons of any person which has the properties hasDaughter and hasSon, among others, which SPARQL composite property can we use?

Select one alternative:

- ?person : hasDaughter AND :hasSon ?child
- ?person : hasDaughter | :hasSon ?child
- ?person : hasDaughter OR :hasSon ?child

Maximum marks: 0.5

- 48 **We have modelled an ontology about Dogs, but not all dogs have the same information available (e.g., some dogs have owner, birthplace, and race, whereas others only race). If we want to retrieve all the dogs we have in our knowledge graph together their information about race and birthplace, which SPARQL clause we should use to ensure that we will retrieve all dogs?**

We have modelled an ontology about Dogs, but not all dogs have the same information available (e.g., some dogs have owners, birthplaces, and race, whereas others only race). If we want to retrieve all the dogs we have in our knowledge graph together their information about race and birthplace, which SPARQL clause should we use to ensure that we will retrieve all dogs?

Select one alternative:

- FILTER
- OPTIONAL
- EXISTS

Maximum marks: 0.5

49 **About Linked Open Data Cloud**

About Linked Open Data Cloud

Select one alternative:

- LOD Cloud is the Google for the Knowledge Graphs.
- LOD Cloud is a vocabulary for linking data sets over the web of data.
- LOD Cloud is a project which aims to linking open data sets on the Web.

Maximum marks: 0.5

50 **About Apache Jena**

About Apache Jena

Select one alternative:

- Apache Jena has a graph DB
- Apache Jena has both options available, a graph DB and a triple-store.
- Apache Jena has a triple-store

Maximum marks: 0.5