11. Given the following knowledge base

@PREFIX ex: <http://example.org/>.
ex:st1 ex:studies ex:AI;
foaf:name “Keerti Shetty”.
ex:st2 ex:studies ex:AI, ex:CS;
foaf:name “Gabriel Ansah”.
ex:st3 ex:studies ex:AI;
foaf:name “Maliki Fofana”.
ex:st4 ex:studies ex:CS;
foaf:name “Ramzy Labidi”.
ex:st5 ex:studies ex:AI;
foaf:name “Amalia Stuger”.

```
SELECT ?x (COUNT(?y) as ?nb_y)
WHERE {
?y ex:studies ?x
}GROUP BY (?x) ORDER BY DESC (?nb_y)
```

A.

?x	?nb_y
ex:AI	“4”
ex:CS	“2”

B.

?x	?y	?nb_y
ex:AI	“4”	“6”
ex:CS	“2”	“6”

C.

?x	?nb_y
ex:st1	“1”
ex:st2	“2”
ex:st3	“1”
ex:st4	“1”
ex:st5	“1”

D.

?x	?nb_y
ex:st2	“2”

12. Given the following knowledge graph and sparql query

prefix ex: <http://example.org>.

ex:Dog1 a ex:Dog

ex:name “Rox the dog”

ex:breed ex;German shepard

ex:isOwnedBy ex:Leyla

ex:Dog2 a ex:Dog

ex:name “George Bush”

ex: Dog3 a ex:Dog

ex:name “Pandora”

ex:breed ex:Siamese

```
SELECT ?Dog ?breed ?name
WHERE {
?Dog <http://example.org/name> ?name
        <http://example.org/breed> ?breed
filter(?name = “George Bush”)
}
```

What should be changed in the above sparql query for obtaining the following results?

Dog	breed	name
Dog2		“George Bush”

A. Line 4 should be changed to: **OPTIONAL** {?Dog <http://example.org/breed> ?breed}

B. Line 1 should be changed to: **SELECT {?Dog ?name -(?breed)}**
C. Line 5 should be changed: **FILTER (?breed = “”)**
D. Line 2 should be changed: **CONSTRUCT ?Dog ?breed ?name**

13. Consider the knowledge graph from the previous question.

prefix ex: <http://example.org>.

ex:Dog1 a ex:Dog

ex:name “Rox the dog”

ex:breed ex;German shepard

ex:isOwnedBy ex:Leyla

ex:Dog2 a ex:Dog

ex:name “George Bush”

ex: Dog3 a ex:Dog

ex:name “Pandora”

ex:breed ex:Siamese

Which of the following statements is true:

A. <http://example.org/name> a owl:objectProperty
B. <http://example.org/breed> a owl:inverseFunctionalProperty
C. <http://example.org/isOwnedBy> a owl:transitiveProperty
D. None of the above

14. consider the following OWL ontology:
ex:p rdf:type owl:FunctionalProperty
ex:q rdf:type owl:InverseFunctionalProperty
ex:x ex:p ex:y
ex:x ex:p ex:z
ex:x ex:q ex:y
ex:z ex:q ex:y
Which of the following statements can be derived:

A. ex:y owl:sameAs ex:z
B. ex:x owl:sameAs ex:z
C. ex:x owl:sameAs ex:y
D. ex:p owl:equivalentPropertyOf ex:q
E. ex:x owl:differentFrom ex:y
F. ex:x owl:differentFrom ex:z
G. Nothing as the ontology

15.Consider the following OWL ontology:

```
myont:Vegeterian rdfs:subClassOf myont:Person;
                        rdfs:subClassOf  [a owl:restriction;
                                                owl:onProperty myont:eats;
                                                owl:allValuesFrom   myont:VegetarianFood].
        myont:bob a myont:Vegetarian;
        myont:eats myont:marzipan
```

Which of the following statements can be derived?

A. myont:bob myont:eats myont:VegetarianFood
B. myont:marzipan a myont:VegetarianFood
C. nothing can be derived
D. the knowledge base is inconsistent

16. Consider the following OWL ontology:

```
ex:Catlover owl:subClassOf [rdf:type owl:Restriction;
                owl:onProperty ex:owns;
                owl:minQualifiedCardinality “3”^^xsd:integer;
                owl;onClass ex:Cat]
ex:mary ex:owns ex:fifi, ex:foofoo, ex:flopsie, ex:fluffy.
```

What is inferred using OWL semantics?

A. ex:mary a ex:Catlover.
B. ex:fifi a ex:Cat
C. nothing is inferred
D. The ontology is inconsistent

17. Which of the following statements about mathematical relations expressed?

A. **greaterThan** (>) is transitive.
B. **smallerThan** (<) is symmetric.
C. **equalTo (=)** symmetric.
D. **equalToOrGreaterThan(>=)** is transitive.
E. **equalToOrSmallerThan(=<)** is a functional property.

18. Which of the following statements **can be made in OWL but NOT in RDFS?**

A. That something is a property
B. That something is an instance of a class
C. That something is the empty class
D. That every time a property is used, the object of that property is an instance of a certain class
E. That there is exactly one object in a relation with a certain property for a certain class
F. that two objects are the same
G. That all instances of a class, are also instances of another class
H. That a property is symmetric
I. That every time a property holds between two things, another property also holds

19. Given the four following statements: ex:Tree, ex:OakTree, ex:LivingThing, ex:Nature, ex:PlantStudies.
Which of the following statements are true?

A. ex:Tree skos:broader ex:OakTree
B. ex:Nature skos:related ex:LivingThing
C. ex:Tree rdfs:subClassOf ex:PlantStudies
D. ex:Tree skos:broader ex:PlantStudies
E. ex:OakTree rdfs:subClassOf ex:Tree
F. ex:Tree rdfs:subClassOf ex:Nature

@prefix ont1: <http://example.org/> ont1:fr a ont1:Country; ont1:hasCapital ont1:Paris; rdfs:label “France”@en. ont1:ge a ont1:Country; ont1:hasCapital ont1:Berlin; rdfs:label “Germany”@en. ont1:Country rdfs:subClassOf ont1:GeoEntity rdfs:label “country”@en	ont1:frankrijk a ont1:Land; ont1:hasCity ont1:Paris; ont1:hasCity ont1:Marseille; rdfs:label “France”@en ont1:duitsland a ont1:Land;; rdfs:label “Germany”@en.

20. Given two ontologies to align. Which triples would be good alignment triples?

A. ont1:fr owl:sameAs ont2:frankrijk
B. ont1:fr owl:equivalentClass ont2:duitsland
C. ont1:hasCapital rdfs:subpropertyOf ont2:hasCity
D. ont1:Country owl:disjointWith ont2:Land
E. ont1:fr skos:related ont2:frankrijk
F. ont1:hasCapital skos:broader ont2:hasCity

21.Which are the steps in the ontology engineering 101 methodology?

A. consider reuse of existing ontologies
B. determine scope and context
C. enumerate terms
D. use the FOAF ontology
E. start with a top-level ontology such as DBpedia
F. define SKOS semantics
G. use RDFS domain and range to derive inconsistencies
H. insert annotation properties