

Semantic Web Test 24.01.2017

Group 1

| No. | A | B | C | D |
|-----|---|---|---|---|
| 1 | X | | X | X |
| 2 | X | X | | |
| 3 | | X | X | |
| 4 | X | | X | |
| 5 | | X | X | |
| 6 | X | X | X | X |
| 7 | X | | X | |
| 8 | X | | X | |
| 9 | X | X | | X |
| 10 | X | X | | X |
| 11 | X | | | |
| 12 | | X | X | X |
| 13 | | X | X | |
| 14 | X | | X | |
| 15 | | X | | X |
| 16 | X | | X | |
| 17 | | X | | |
| 18 | | | X | X |
| 19 | | X | | |
| 20 | | | X | X |

1. Which statements about syntax, semantics, context, and pragmatics are true?

a) Syntax is the definition of normative structure of data

b) Well-defined syntax is sufficient for a statement to be considered machine-readable.

c) Semantics is the branch of linguistics and logic concerned with meaning.

d) Pragmatics is the study of applying language in different situations.

2. Which of the following statements about URNs, URLs and URIs are true?

a) A URL is a type of URI

b) All URLs are URIs

c) URNs provide all the information a client needs to locate a resource

d) e99999@student.tuwien.ac.at is a URL

3. Ontology

- a) In philosophy, ontology is concerned with how we know things
- b) in philosophy, ontology is concerned with what things are.**
- c) in computer science, an ontology is a formal specification of a shared conceptualization of a domain of interest**
- d) an ontology is specified using relational algebra and formed from named entities and attributes

4. The (original) semantic web aimed to ...

- a) make the web “machine-readable”**
- b) enrich the web with machine learning and natural language processing
- c) apply reasoning to derive new knowledge from existing information**
- d) replace the existing web technologies with semantic counterparts

5. Which of the following statements about Linked Data are correct?

- a) OWL must be used to create valid Linked Data sets.
- b) Linked Data should be self-describing.**
- c) Linked Data is based on the ideas of explicit semantics and unique identifiers**
- d) the Linked Data cloud is centrally hosted by a Cloud Service Provider

6. Which of the following statements about the interlinkage between datasets in Linked Data are correct?

- a) owl:sameAs is commonly used for interlinking data sets at the instance-level**
- b) VOID linksets are collections of RDF links between two RDF data sets**
- c) owl:sameAs is symmetric, transitive, and reflexive**
- d) RDF resources linked with owl:sameAs are indistinguishable and can be merged into a single resource**

7) Which of the following statements about embedding Semantics in web pages are correct?

- a) RDFa is a W3C Recommendation for encoding RDF statements in web pages**
- b) Multiple vocabularies can easily be mixed in a document’s microformat annotation
- c) Multiple vocabularies can easily be mixed in a document’s RDFa annotation**
- d) RDF that has been embedded directly into web pages is typically interpreted by browsers and search engines

8) Which statements about RDF statements are correct?

- a) **An RDF statement's subject can be another statement's object**
- b) An RDF statement's subject can be a resource or literal
- c) **An RDF statement can make a statement about another statement.**
- d) A collection of RDF statements forms an unlabeled bi-partite graph.

9. Which statements about RDF blank nodes are true?

- a) **Blank nodes represent resources without a URI or literal.**
- b) **A blank node has no globally unique identifier**
- c) A predicate may be represented by a blank node
- d) **Blank nodes can be used to group related information.**

10. Which statement about RDFS are correct?

- a) **RDFS provides primitives for lightweight ontologies.**
- b) **RDFS allows multiple inheritance for classes and properties.**
- c) Using RDFS we can express that each student has exactly one thesis advisor
- d) **RDFS can be used to define class and property hierarchies.**

11. Which of the statements about RDF-S entailment regimes are true?

- a) **The rdfs:range of a property determines class membership of the object used with this property in a triple.**
- b) The rdfs:domain of a property determines class membership of the object used with this property in a triple
- c) rdfs:subPropertyOf is used to determine the type(s) of a resource
- d) rdfs:subClassOf is used to infer that a resource related by one property is also related by another

12. Which of the following statements about SPARQL are true?

- a) ASK queries return an RDF graph or triple
- b) **SPARQL graph patterns are specified using a Turtle/N3 style syntax**
- c) **SPARQL is based on graph pattern matching**
- d) **SELECT queries return a tabular result set**

13. Get the result from a given SPARQL query

14. Which statements are true about Open World Assumption and Close World Assumption

- a) **CWA assumes that all information is known about all individuals in the domain.**
- b) Under CWA an ontology becomes more restrictive as we constrain it iteratively
- c) **For CWA no explicit declaration of falsehood is necessary.**
- d) Under OWA we must declare that something existing before we can make statements about it

15. Which statements about propositional logic (PL), first order logic (FOL) and Description Logics (DLs) are correct

- a) PL extends FOL with quantifiers
- b) **FOL allows generalization through statements about sets of entities**
- c) FOL is typically decidable and therefore used as a foundation for OWL
- d) **DLs use TBox for terminological knowledge and ABox for assertional knowledge**

16. Which of the following statements about OWL ontologies are correct?

- a) **A single instance can be classified under two different classes**
- b) Each individual must have a single unique name
- c) **When an instance is not asserted to be member of a class, it cannot be deduced that it is not member of that class**
- d) By default, each property can have only one (unique) value y for each instance x

17. Which group of people is described by the following class expression?

$\text{Person} \sqsupset \exists \text{gender.Male} \sqsupset \exists \text{hasChild.} \exists \text{hasChild.}$

- a) A parent of a male child
- b) **Grandfathers**
- c) A father of two children
- d) A person who has at least one grandson

18. Assume the following knowledge base:

fatherOf(adam, bert)

fatherOf(adam, carl)

male(bert)

male(carls)

Consider the following question formulated in Description logic

? $\models \forall \text{ fatherOf.male}(\text{adam})$

a) under cwa the answer is no

b) under cwa the answer is unknown

c) under cwa the answer is yes

d) under owa the answer is unknown

19. OWL property restrictions

Which owl property restriction of :siblingOf allows us to infer

:anna :siblingOf :bert

from

:bert :siblingOf :anna

a) owl:functionalProperty

b) owl:symmetricProperty

c) owl:equivalentProperty

d) owl:inverseOf

20. Which one of the following statements about OWL inverse functional properties are true?

a) No two individuals can be connected using an inverse functional property to a third individual.

b) An inverse functional property can have only one (unique) value y for each instance x

c) For a given subject, there can be at most one individual that is related to the subject via the inverse functional property

d) if a property is inverse-functional then the object of a property statement uniquely determines the subject

Group 2

| No. | A | B | C | D |
|-----|---|---|---|---|
| 1 | | | | X |
| 2 | X | | X | X |
| 3 | | X | | X |
| 4 | | | X | |
| 5 | | | | X |
| 6 | X | | | |
| 7 | | X | X | |
| 8 | X | | X | X |
| 9 | X | | X | |
| 10 | X | X | X | |
| 11 | X | | X | X |
| 12 | X | | X | |
| 13 | X | | | X |
| 14 | | X | | X |
| 15 | X | | X | |
| 16 | | | | X |
| 17 | | | | X |
| 18 | X | | X | |
| 19 | | | X | |
| 20 | X | | X | |

1. Which statements about syntax, semantics, context, and pragmatics are true?

- a) Semantics is the study of applying language in different situations
- b) The semantic web provides a context free grammar
- c) When modelling a domain of interest in an ontology, choosing inappropriate properties will result in a syntactically invalid ontology
- d) The idea that a sentence may have a different meaning when spoken by different people with varying intent is a matter of pragmatics**

2. Which of the following statements about URNs, URLs and URIs are true?

- a) A URN is a type of URI**
- b) All URIs are URLs
- c) A URN is a persistent identifier for a web resource**
- d) <mailto:e99999@student.tuwien.ac.at> is a URL**

3. Ontology

- a) In philosophy ontology is concerned with how we know things
- b) In philosophy ontology is concerned with what things are**
- c) In computer science an ontology is a plain informal description of a domain of interest
- d) An ontology specifies both a vocabulary and its intended meaning**

4. The (original) semantic web aimed to...

- a) enrich the web with machine learning and natural language processing
- b) replace existing web technologies with semantically enhanced counterparts
- c) create an environment that can be navigated by software agents**
- d) facilitate easy access to data by defining a set of APIs

5. Which of the following statements about linked data are correct

- a) SPARQL endpoints are necessary to locate resources on the web of LD
- b) LD is a top-down concept for highly centralized data-integration
- c) LD allows users to create hyperlinks between semantically annotated documents
- d) LD should be self-describing**

6. Which of the following statements about the interlinkage between datasets in LD are correct?

- a) LD can create links between data items in different data sets**
- b) The target of an owl:sameAs link must confirm before equivalence is established
- c) rdfs:seeAlso is symmetric, transitive and reflexive
- d) resources linked with rdfs:seeAlso are indistinguishable and can be merged into a single resource

7. Which of the following statements about embedding semantics in web pages are correct?

- a) microformats are a W3C recommendation for the encoding of semantics in webpages
- b) microdata is a HTML5 language extension that provides a mechanism for embedding machine-readable data by directly annotating the DOM**
- c) Multiple vocabularies can easily be mixed in a document's RDFa annotation**
- d) embedding RDF directly into web pages results in fine-grained interweaving of web content and semantic annotation

8. Which statements about RDF statements are correct?

- a) **An RDF statement's object can be another statement's object**
- b) An RDF predicate can be an anonymous resource (blank node)
- c) **a collection of rdf statements forms a labeled directed multi graph**
- d) **an rdf statement can make a statement about another statement**

9. Which statements about rdf blank nodes are true?

- a) **blank nodes represent resources without a URI or literal**
- b) each blank node has a globally unique identifier
- c) **blank nodes are considered existential variables**
- d) blank nodes facilitate improved reasoning

10. Which statement about RDFS are correct?

- a) **RDFS can be used to restrict the permissible domain and range of properties**
- b) **using RDFS we can express that all students are humans**
- c) **RDFS allows multiple inheritance for classes and properties**
- d) RDFS can be used to express class and property disjointness

11. Which of the statements about RDF-S entailment regimes are true?

- a) **the rdfs:domain of a property determines class membership of the subject used with this property in a triple**
- b) the rdfs:range of a property determines class membership of the subject used with this property in a triple
- c) **rdfs:subClassOf is used to determine the type(s) of a resource**
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12. Which of the following statements about SPARQL are true?

- a) **SPARQL supports ALTER, SELECT, DROP and DESCRIBE query forms**
- b) SPARQL relies on relational algebra as a theoretical foundation
- c) **CONSTRUCT queries return an RDF graph or triple**
- d) SELECT queries return an RDF graph or triple

13. Get the result from a given SPARQL query

14. Which statements about open world assumption and close world assumption are true

- a) owa assumes that all information is known about all individuals in the domain
- b) under owa an ontology becomes more restrictive as we constrain it iteratively**
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15. What statements about propositional logic, first-order logic and description logics are correct?

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16. Which of the following statements about OWL ontologies are correct?

- a) individuals in owl cannot be members of multiple classes
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17. See Group one

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19. OWL property restrictions

Which OWL property restriction on `:motherOf` allows us to infer

`:Carla :motherOf :bob`

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`:bob :hasMother :carla`

- a) `owl:subPropertyOf`
- b) `owl:equivalentProperty`
- c) `owl:InverseOf`**
- d) `owl:TransitiveProperty`

20. Which of the following statements about owl invers functional properties are true?

- a) If a property is invers-functional then the object of a property statement uniquely determines the subject**
- b) for a given object there can be at most one individual that is related to the subject via the invers functional property
- c) if two individuals (subjects) are related to a third individual via an invers functional property then it can be inferred that they are the same individual.**
- d) If a pair (x, y) is an instance of the inverse functional property P , and the pair (y, z) is also an instance of P then we can infer the pair (x, z) is also an instance of P

Merged group 1 + group 2 (the bold ones are true)

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Person \sqcap \exists gender.Male \sqcap \exists hasChild. \exists hasChild.

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- c) under cwa the answer is yes**
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 - d) If a pair (x, y) is an instance of the inverse functional property P , and the pair (y, z) is also an instance of P then we can infer the pair (x, z) is also an instance of P