

Semantic Systems 2023W  
Exam 19 January 2024

**Part 1:** true or false

correct = +1

wrong = -1

no answer = 0

Q1: RDFS allows the definition of subproperties.

Q2: SHACL is equivalent to OWL.

Q3. Mathematically, a knowledge graph can be described as a directed labelled graph.

Q4. Blank nodes can occur in any position of an RDF triple.

Q5: RML allows to specify XML sources.

Q6. N-Triples are a valid serialization format of RDF triples.

Q7: Evaluating a SPARQL query with entailment regimes always leads to fewer results.

Q8: `?` is used to denote blank nodes in RDF.

Q9: OWL ontologies can be exchanged as RDF documents.

Q10: The "Open World Assumption" allows us to consider missing information as negative information.

Q11: Using RDFS, we can express the fact that every child has exactly one father.

Q12: RDFS allows multiple inheritance for classes and properties.

Q13: The result type of an ASK query is an RDF graph or triple.

Q14: SPARQL uses primary keys for subgraph merging.

Q15: The result type of a CONSTRUCT query is a Boolean.

Q16. Internationalized Resource Identifiers (IRIs) are a subset of Uniform Resource Identifiers (URIs).

Q17: A SPARQL query can be evaluated on the default graph.

Q18: R2RML is a superset of RML.

Q19: SPARQL supports JOIN clauses.

Q20: RDFS provides a wider range of ontological constructs than OWL.

**Part 2:** open questions, 4 points each

Q21. Write a query that checks whether triple (`:s`, `:p`, `:o`) occurs in RDF graph <http://example.org/g.ttl>

Q22. Given the following query:

```
SELECT ?x ?z
WHERE {
  { ?x :p ?z . }
  UNION
  { ?x :q _:y . _:y :q ?z . }
}
```

Identify the triple patterns and the basic graph patterns in the query.

Q23. Consider the following OWL statements:

```
:Writer a owl:Class .
:Author a owl:Class .
:Poet a owl:Class ;
  rdfs:subClassof :Writer .
:Writer a owl:Class ;
  rdfs:subClassof :Creative .
:Writer owl:equivalentClass :Author .
```

List at least two OWL statements (not already listed above) that are entailed by the above.

Q24. Please formulate the following information in RDF by making a statement about a statement.

*The statement "McCoy is a doctor" is attributed to Kirk.*

Q25.