Distributed Information Systems: Spring Semester 2016

Quiz 2: Overview on Distributed Information Systems

Student Name: _____ Date: 17 Mar 2016

Student ID: _____ Time: 11:15AM to 11:30AM

Total number of questions: 8

Each question has a single answer!

1. Which of the following statements about commonalities of XML and RDF is **not** correct?

   ☐ *a*) Both XML and RDF documents can be interpreted as graphs.

   ☐ *b*) Both XML and RDF have a schema language.

   ☐ *c*) Both XML and RDF are suitable to encode relational data.

   ☒ *d*) Both XML and RDF support classification and subclass relationships.

2. For which purpose is reification helpful?

   ☒ *a*) It makes it possible to assign a type to a statement. type "createdBy"

   ☐ *b*) It makes it possible to assign a type to the subject of a statement.

   ☐ *c*) It makes it possible to represent complex data types.

   ☐ *d*) It makes it possible to make statements about anonymous resources.

3. Which is the correct expanded form of the following RDF statement:

```
<MaritalStatus rdf:ID="Married"/>
```

   ☐ *a*) `<rdf:statement><rdf:MaritalStatus>Married</rdf:MaritalStatus></rdf:statement>`

   ☒ *b*) `<rdf:statement id="Married"><rdf:type>MaritalStatus</rdf:type></rdf:statement>`

   ☐ *c*) `<rdf:statement id="Married"><rdfs:class>MaritalStatus</rdfs:class></rdf:statement>`

   ☐ *d*) `<MaritalStatus><rdf:subject>Married</rdf:subject></MaritalStatus>`

4. Which of the following statements represents a subclass relationship expressed in first order logic language?

   ☒ *a*) $\forall x$ (herbivore $(x) \implies$ animal(x))

   ☐ *b*) `<owl:Class rdf:ID="herbivore"><rdfs:subClassOf rdf:resource="#animal"/></owl:Class>`

   ☐ *c*) $\forall x$ (carnivore $(x) \iff \forall y$ (eats$(x, y) \implies$ animal(y))

   ☐ *d*) herbivore $\subseteq$ animal

5. Which of the following is **not** true about a Data Graph ?

   ☐ *a*) The minimal number of edges is larger than $|V| - 1$ where $|V|$ is the number of vertices.

   ☒ *b*) The maximal number of possible edges is $(|V|^2 - |V|)/2$ where $|V|$ is the number of vertices.

   ☐ *c*) All nodes must be reachable from at least one root.

   ☐ *d*) Only leaf nodes can store data values.

6. What is the cause that the classification of nodes in a data graph can be ambiguous?

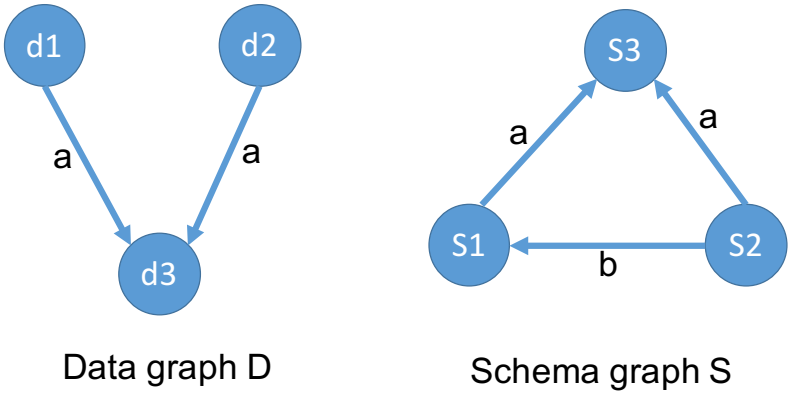
   ☐ *a*) The same data node can belong to multiple classes in the schema graph.

   ☒ *b*) There exist several different simulation relationships that can result in different classifications of nodes.

   ☐ *c*) It is not clear which graph is the data and the schema graph when the graphs are simulation equivalent.

   ☐ *d*) There exist cases in which there is no uniquely defined maximal simulation.

7. Given the data graph and the schema graph shown below. Which of the following is true:



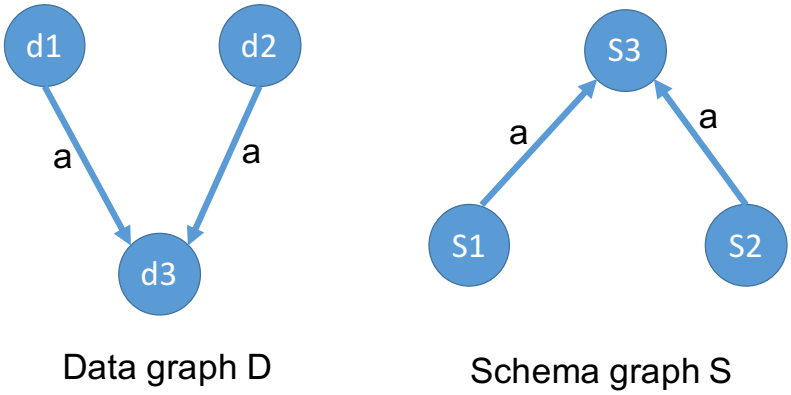
☒ *a*) S simulates D. **But** D doesn't simulate S.

☐ *b*) D doesn't simulate S. **And** S doesn't simulate D.

☐ *c*) D simulates S. **But** S doesn't simulate D.

☐ *d*) S and D simulate each other.

8. Consider the new data graph and schema graph below. You know that S simulates D (i.e. D<S). To which class(es) would node d1 belong in the maximal simulation relationship.



☐ *a*) Class S1 only

☐ *b*) Class S2 only

☐ *c*) Classes S1 and S3

☒ *d*) Classes S1 and S2