

# Exam Questions Sample – Description Logics

In case of choice questions, zero, one or all choices might be correct. Tick all choices you consider correct. Read each item and choice carefully.

## 1. item

Description logics:

- a) are decidable fragments of first order predicate logics.
- b) accept, like relational databases, the closed world assumption (CWA).
- c) accept, unlike first-order predicate logics the closed world assumption (CWA).
- d) require PTIME (polynomial in time) algorithms for satisfiability checking.

## 2. item

The axiom  $Animal \sqcap (\leq 3 \text{ hasLeg}) \sqsubseteq Millepede \sqcup Spider$  :

- a) implies that “Each animal having 2 legs is not a millepede”.
- b) implies that “Each animal having 3 legs is a millepede”.
- c) implies that “Each millepede has at least 3 legs”.
- d) is an ALC axiom.

## 3. item

Consider an ALC ontology consisting of the following axioms:

$$\begin{aligned} Person &\sqsubseteq \exists \text{hasFriend} \cdot Person \\ &Person(\text{Jan}) \\ &\text{hasFriend}(\text{Jan}, \text{SomeDog}) \\ &(\neg Person)(\text{SomeDog}) \end{aligned}$$

Decide whether the ontology is consistent or not. Each step of the algorithm describe in detail and depict it suitably. If the ontology is consistent, provide one of its interpretations.

4. **item**

Consider the conjunctive query  $Q() \leftarrow hasChild(?x, ?y), Person(?y)$ . Decide whether the query is boolean. Describe, what is the *rolling-up technique* and whether/how can be used for evaluating of this query.