COMP 62342

Two hours - online

The exam will be taken on line.
This paper version is made available as a backup
In this event, only MCQ answers written in the boxes on the exam paper will be marked.

EXAM PAPER MUST NOT BE REMOVED FROM THE EXAM ROOM

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Ontology Engineering for the Semantic Web

Date: Monday 4th June 2018

Time: 09:45 - 11:45

Please answer ALL Questions provided.

The exam contains MULTIPLE CHOICE, TRUE/FALSE and SHORT ESSAY QUESTIONS. Be sure to answer ALL Questions.

Please note that wrong answers on MULTIPLE CHOICE and TRUE/FALSE questions may be penalized (i.e. receive some small negative mark) so random guessing works against you.

This is a CLOSED book examination

The use of electronic calculators is NOT permitted

[PTO]

Q1 – Q24 contain multiple choice questions (MCQs) and are restricted for publication

25. Write an axiom in Manchester Syntax that states that

    each and every instance of class A

    - is an instance of B,
    - has a p-successor that is **not** an instance of A, and
    - has no p-successor that is an instance of B or C.

    (4 marks)

26. Sketch out a design for an application that checks whether, in a given ontology, `only` restrictions were used and, if so, on which properties. Identify the key features of the OWL API that you would use in doing so. Would reasoning play any role in such an application? Answer in 4-5 sentences. (5 marks)

27. Consider the following scenario:

    Animals

    - fall in different categories such as Mammals, Birds, Reptiles, Insects, Fish, etc.
    - live in different habitats such as forest, desert, ocean, river, etc. These habitats can be in different geographical regions, including countries or continents.
    - eat something, for example plants or other animals.
    - move (with very few exceptions), for example by walking or swimming or flying. They usually do this by making use of certain body parts, for example wings, feet, or hoves.

    Using the normalisation approach to writing an ontology, which major dimensions of classification would you use when modelling this scenario? Give the root classes you would use for each of the dimensions and example named subclasses if applicable. Also, indicate the PIMPS classes these root classes would fall into. Name four important properties that you would use to connect these dimensions, and give their domains and ranges. (7 marks)

28. Consider again the scenario from the previous question:

    Animals

    - fall in different categories such as Mammals, Birds, Reptiles, Insects, Fish, etc.
    - live in different habitats such as forest, desert, ocean, river, etc. These habitats can be in different geographical regions, including countries or continents.
    - eat something, for example plants or other animals.
    - move (with very few exceptions), for example by walking or swimming or flying. They usually do this by making use of certain body parts, for example wings, feet, or hoves.

    Assume you want to describe, in your animal ontology, the fact that penguins swim with the help of their wings, whereas ducks swim with the help of their feet, and ducks fly with the help of their wings. Formulate 2-3 OWL axioms in Manchester Syntax that describe the above behaviour (minor syntax errors will be ignored). (3 marks)

29. Consider again the scenario from the previous question:

    Animals

    - fall in different categories such as Mammals, Birds, Reptiles, Insects, Fish, etc.
    - live in different habitats such as forest, desert, ocean, river, etc. These habitats can be in different geographical regions, including countries or continents.
    - eat something, for example plants or other animals.
    - move (with very few exceptions), for example by walking or swimming or flying. They usually do this by making use of certain body parts, for example wings, feet, or hoves.

    In max. 4 sentences and using examples from this scenario, explain what post-coordination is, and describe the benefits of using a formalism that supports post-coordination for a web application where people can search for animals. (4 marks)

END OF EXAMINATION