

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: Tuesday 23rd May 2017

Time: 09:45 - 11:45

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**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.**

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This is a CLOSED book examination

The use of electronic calculators is NOT permitted

[PTO]

*Q1 - Q25 contains MCQ questions and are restricted, therefore we are unable to publish these Questions.*

26. 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 an instance of A, and
- has no  $p$ -successor that is an instance of B or C.

(4 marks)

27. Sketch out a design for an application that checks whether, in a given ontology, cardinality restrictions were used and, if so, what the numbers involved were. 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)

28. Consider the following scenario:

Items of furniture

- fall in categories such as chairs, sofas, tables, etc., and
- are made from wood, metal, fabrics, and combinations of these.

Fabrics

- are made from fibres through weaving, felting, knitting, etc. We can distinguish between natural fibres such as cotton or silk, and artificial fibres such as nylon or polyester.

Wood

- comes from trees which, in turn, are described by their country of origin and their species, like pine, oak, etc.

Wood

- can be used either as solid wood, as veneer, or in an engineered way, and it
- can be treated by application of paint, varnish, wax, etc.

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 three important properties that you would use to connect these dimensions, and give their domains and ranges. (8 marks)

29. Consider again the scenario from the previous question:

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- can be treated by application of paint, varnish, wax, etc.

In max. 6 sentences and using examples from this scenario, explain what post-coordination is, and describe the benefits of a formalism that supports post-coordination. (5 marks)