

Two hours

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 6th June 2016

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]

# ***COMP62342***

***Q1 – Q24 are Multiple  
Choice Questions and  
are therefore  
restricted***

25. Sketch out a design for an application that checks the profile (e.g. OWL QL, OWL EL etc) of an ontology. 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)

26. Consider the following:

*A bicycle is a device that consists of complex components, including for example two wheels and a frame. A wheel consists of a rim, a hub, spokes, and a tyre. A bicycle that has a faulty part is a faulty bicycle.*

What design pattern might we use to capture this kind of reasoning? Sketch out the axioms that you would need to describe the situation above. Answer in 4-5 sentences. (4 marks)

27. Write an axiom in Manchester Syntax that states that an instance of class  $C$  must have an  $r$ -successor that is both an instance of  $A$  and  $B$ , but no  $r$ -successor that is an instance of  $D$ . (3 marks)

28. Consider the following scenario:

Items of clothing fall in categories such as jumpers, trousers, etc., and are made from fabrics. 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. Different fibres have different properties, including their ability to resist heat and to absorb moisture. Fabrics can be subject to further treatment such as printing or crinkeling. An item of clothing can be made from a variety of fabrics, usually sewn together using a thread and needle, either by hand or using a machine.

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. Also, indicate the PIMPS classes these root classes would fall into. (5 marks)

29. Consider again the scenario from the previous question:

Items of clothing fall in categories such as jumpers, trousers, etc., and are made from fabrics. 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. Different fibres have different properties, including their ability to resist heat and to absorb moisture. Fabrics can be subject to further treatment such as printing or crinkeling. An item of clothing can be made from a variety of fabrics, usually sewn together using a thread and needle, either by hand or using a machine.

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