Two hours - on line

The exam will be taken on line.
This is the paper format, which will be available as a backup.

QUESTION PAPER MUST NOT BE REMOVED FROM THE EXAM ROOM

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Ontology Engineering for the Semantic Web

Date: Tuesday 15th January 2013
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
Questions 1-24 are restricted and cannot be published
25. The following fragment of a concept hierarchy occurs in an ontology being developed to describe popular music. Identify a potential problem with this relationship, using Ontoclean properties to justify your answer and suggest a solution.

GroupOfPeople subClassOf Band

(3 marks)

26. Discuss why violation of OntoClean constraints does not necessarily lead to logical inconsistency.

(2 marks)

27. Consider the following:

My foot is part of my leg. My leg is part of me. Thus my foot is part of me.

My leg is part of me. I am part of the Information Management Group. Thus my foot is part of the Information Management Group.

The first of these inferences is valid, while the second is not. Why not? How might you formulate an ontology so that only “correct” inferences are drawn?

(5 marks)

28. Consider the following:

A Fault in an Engine which is part of a Car is necessarily a Fault in the Car

What design pattern might we use to capture this kind of reasoning in a language that does not support transitivity or role chains? Sketch out the classes that you would need to describe the situation above.

(5 marks)

29. Consider the following source text:

A witch is a female who burns. Sally is made of wood. If something is wooden, then it burns. Floating things are made of wood. Sally is female. Sally is a witch!

Transliterate each of the above sentences as a corresponding OWL axiom in roughly Manchester syntax.

(6 marks)
30. Using OWL as a running example, explain the engineering tradeoffs embodied in the design triangle:

![Diagram showing the design triangle with Expressivity, Usability, and Computability]

(5 marks)

31. Explain the benefits of using a (logic-based) ontology to represent a terminology (i.e., a controlled vocabulary such as a taxonomy), distinguishing the cases when the ontology is used only at development time from when it is also used at runtime. (5 marks)

32. Compare and contrast OWL (as a logic based language) with SKOS (a navigation oriented language). Be sure to discuss analogous constructs (SubClassOf vs. skos:narrower) and what sorts of applications they are each suited (or not suited) for. (5 marks)