Two hours - on line

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

THE QUESTION PAPER MUST NOT BE REMOVED FROM
THE EXAM ROOM AND MUST BE RETURNED

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Knowledge Representation and Reasoning

Date: Monday 2nd June 2014
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.

This is a CLOSED book examination
The use of electronic calculators is NOT permitted
Q1 to Q24 are restricted and cannot be published
25. A knowledge engineer has built an OWL ontology about *Polecats*, a certain animal, based on two pieces of elicited knowledge:

- Polecats live in France and Spain, two European countries;
- Polecats eat only mice.

The resulting ontology produced by the engineer comprises the following set of five syntactically valid OWL axioms:

| 1 | Europe SubClassOf: Continent          |
| 2 | France SubClassOf: Europe             |
| 3 | Spain SubClassOf: Europe              |
| 4 | Polecats SubClassOf: LivesInFranceAndSpain |
| 5 | Polecats EquivalentTo: eats only Mice   |

Critically think about the appropriateness of the five axioms. Then answer the following questions: do the axioms make proper use of the expressive power of OWL? Do they lead to undesirable inferences? If necessary, suggest appropriate changes to the existing axioms. Should additional axioms be introduced? If so, what should be added? (6 marks)

26. Using OWL as a running example, explain the engineering tradeoffs embodied in the design triangle:

![Design Triangle Diagram](diagram.png)  

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