Indian Statistical Institute
Documentation Research and Training Center

MS in Library and Information Science
Semester Exam (IV semester) (2014-2016)
Paper –20 : SEMANTIC WEB

Date: 13.06.2016   Max Marks: 100
                                                                                 Time: 3 Hours

*Answer the **question number 1** plus any **four questions** from the rest six questions. All questions carry equal marks.*

1. Answer all the questions.   [2*10 = 20]
(i) What is a model?
(ii) What is *ALC* in DL?
(iii) What is a punning?
(iv) Name any two properties that are included in OWL 2.0 and was not available in OWL 1.0.
(v) Write down the DL axiom for the following statement: *persons that are female*.
(vi) Write down the DL axiom for the following statement: *persons all of whose children are female*.
(vii) Interpret the following DL axiom: *Parent ≡ ∃parentOf. T*
(viii) What is a *symmetric property*?
(ix) Discuss the uses of *rdf:type*?
(x) What is a triple store?

2. What is an ontology? Discuss with an example any one ontology development methodology that you know.   [20]

3. (a) What is a Resource Description Framework (RDF)? Discuss it with examples. [10]
   (b) Discuss the salient features of OWL 2.0 over OWL 1.0.   [10]

4. (a) Discuss the differences of an ontology from a thesaurus and a metadata. [10]
   (b) Model an ontology using the RDFS constructors based on the following knowledge. The ontology *may* contain additional concepts, as required.

    Pompi is an animal.
    Pepsi is a cat.
    Cats are animals.
    Natioanl Zoo of Bangalore hosts Tomy.
    Zoos host animals.

5. (a) Discuss in details the salient features of OWL over RDFS.

(b) Given the following RDF triples

```
@prefix dc: <http://purl.org/dc/elements/1.1/> .
@prefix rec: <http://bookstore.com/records#> .
@prefix inv: <http://bookstore.com/inventory#> .

rec:book1 dc:title "David Copperfield" .
rec:book1 dc:creator "Charles Dickens".
rec:book1 inv:price 1250 .
rec:book1 inv:quantity 3 .

rec:book2 dc:title "The Woman in White" .
rec:book2 dc:creator "Wilkie Collins".
rec:book2 inv:price 950 .
rec:book2 inv:quantity 5 .

rec:book3 dc:title "Pilgrim's Progress" .
rec:book3 dc:creator "John Bunyan".
rec:book3 inv:price 1750 .
rec:book3 inv:quantity 2 .

rec:book4 dc:title "Emma" .
rec:book4 dc:creator "Jane Austen".
rec:book4 inv:price 1825 .
rec:book4 inv:quantity 8 .
```

(i) Write a SPARQL query that returns all the available books cost more than Rs. 1000. The output should list only the title, author and price of the books. [8]
(ii) Show the result of the query in a tabular form. [2]

6. (a) What is Description Logics (DL)? Describe *concept*, *roles* and *individuals* of DL.
[2+8]
(b) What is a reasoning? Briefly discuss the various reasoning tasks. [2+8]

7. Answer *any four* from the following. [4*5=20]
 (a) Illustrate *owl:inverseOf*.
 (b) Briefly discuss a rdf *blank node*.
 (c) Discuss *owl:thing and owl:nothing*.
 (d) Briefly describe the *RDF Collections*.
 (e) Write a short note on *Open Linked Data*.