Indian Statistical Institute
Documentation Research and Training Centre

MS in Library and Information Science
Semester Exam (IV semester) (2017-2019)
Paper –20: SEMANTIC WEB

Date: 03.05.2019

Max Marks: 100
Time: 3 Hours

Answer any ***five*** questions from the following. All questions carry equal marks.

1. What is an ontology? Discuss with examples the steps of designing a domain ontology. [20]

2. (a) Discuss the added features of OWL language introduced in version 2.0. [10]
   (b) Discuss the limitations of RDFS as an ontology language. [10]

3. (a) Briefly describe the following two logical characteristics of properties with examples:
   (i) owl:TransitiveProperty, (ii) owl:SymmetricProperty. [10]
   (b) What is Logic? Briefly discuss the significance of logic in data and knowledge representation. [2+8]

4. (a) What is a reasoner? Briefly discuss the various reasoning tasks of a reasoner. [2+8]
   (b) Given the following RDF data (expressed in Turtle) [10]

```
@prefix foaf: <http://xmlns.com/foaf/0.99/> .
@prefix ex: <http://example.com/instonto#> .
@prefix rdf: <rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .

ex:John rdf:type ex:DoctoralStudent.
ex:John rdf:type owl:NamedIndividual.
ex:John foaf:name "John Smith".
ex:John foaf:age 26.

ex:Marry rdf:type ex:DoctoralStudent.
ex:Marry rdf:type owl:NamedIndividual.
ex:Marry foaf:name "Marry Smith".
ex:Marry foaf:age 25.

ex:Mithun rdf:type ex:DoctoralStudent.
ex:Mithun rdf:type owl:NamedIndividual.
ex:Mithun foaf:name "Mithun Dey".
ex:John foaf:age 29.

ex:Vijay rdf:type ex:DoctoralStudent.
ex:Vijay rdf:type owl:NamedIndividual.
```

ex:Vijay foaf:name "Vijay Srivastava".
ex:John foaf:age 26.

(i) write a SPARQL query to retrieve the *foaf* name of the students of under the age of 26.
(ii) present the result of the above query in a table format.

5. (a) What is a knowledge base? Briefly describe TBox and ABox. [10]
(b) Briefly describe Linked Data. [10]

6. Answer any *four* from the following: [4*5]
(i) Briefly discuss the SPARQL SELECT Query form with an example.
(ii) Write a short note on Knowledge Graph.
(iii) Briefly illustrate the differences between a thesaurus and an ontology.
(iv) Write a short note on description logics.
(v) Write a short note on Simple Knowledge Organization System (SKOS).