Indian Statistical Institute
Documentation Research and Training Center

MS in Library and Information Science
Semester Exam (IV semester) (2022-2024)
Paper –20 : SEMANTIC WEB

Date: 29.04.2024

Max Marks: 100
Time: 3 Hours

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

1. Answer all the questions. [2*10 = 20]

(i) What is 'open world assumption'?

(ii) Define Theory with an example in context of data and knowledge representation.

(iii) Define SPARQL endpoint with at least a name of an endpoint.

(iv) Define ABox with an example.

(v) What is Key in OWL 2.0?

(vi) What is semantic data web?

(vii) What are the domain and range in RDFS?

(viii) Define OWL 2.0 EL.

(ix) Define owl:SymmetricPropert.

(x) Name the SPARQL query forms.

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

3. (a) What is a knowledge graph? Briefly, discuss its various features. [10]

(b) Discuss the essential technologies for the development of knowledge graphs. [10]

4. (a) Illustrate the merits and demerits of ontology language OWL over RDFS. [10]
(b) Draw a formal RDF graph for the following data expressed in RDF/XML. [10]

```
<rdf:RDF xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
         xmlns:voc="http://purl.org/voc/1.1/">
 <rdf:Description rdf:about="https://search.worldcat.org/title/894676497">
        <rdf:type rdf:resource="http://purl.org/ontology/bibo/Book"/>
        <voc:title>Colon classification: edition 7</voc:title>
        <voc:publisher rdf:resource="https://w3id.org/ontobio#SRELS"/>
       <voc:date>1987</voc:date>
       <voc:place rdf:resource="https://w3id.org/ontobio#Bangalore"/>
       <voc:creator rdf:nodeID="x"/>
 </rdf:Description>
 <rdf:Description rdf:nodeID="x">
      <rdf:type rdf:resource="http://www.example.com/Person"/>
      <voc:firstAuthor rdf:resource="https://w3id.org/ontobio#SRRanganathan"/>
      <voc:secondAuthor rdf:resource="https://w3id.org/ontobio#Gopinath"/>
 </rdf:Description>
 <rdf:Description rdf:about="https://w3id.org/ontobio#SRRanganathan">
        <voc:name>S. R. Ranganathan, </voc:name>
 </rdf:Description>
 <rdf:Description rdf:about="https://w3id.org/ontobio#Gopinath">
       <voc:name>M. A. Gopinath</voc:name>
 </rdf:Description>
</rdf:RDF>
```

5. (a) What is knowledge representation? Discuss the features that a knowledge representation language should possess. [2+8]

(b) What is inferencing? Briefly, describe the various tasks of a reasoner. [2+8]

6. Answer *all four* questions [4*5=20]

(a) Briefly, describe Protégé.

(b) Briefly, describe Linked Data.

(c) Briefly, describe domain ontology vs. general purpose ontology.

(d) Briefly, discuss the advantages and disadvantages of logic languages in data and knowledge representation.