Date: 06.05.2022

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.*

Udaya

1. Answer all the questions.   [2*10 = 20]
   (i) What is logic?
   (ii) What is a SPARQL endpoint?
   (iii) Name the primary technologies for Linked Data.
   (iv) Mention the significance of logic language in knowledge representation.
   (v) What is a theory in logic?
   (vi) What is a knowledge base?
   (vii) What is a transitive property?
   (viii) What is a triple store?
   (ix) Mention any four reasons for not considering First Order Logic as a semantic web language.
   (x) Interpret the following DL axiom: Person ⊓ ∀hasDaughter.⊥

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

U.V 3. (a) Briefly, discuss the various uses of an ontology.   [10]
       (b) Write a short note on Linked Data.   [10]

JP 4. (a) Discuss the salient features of OWL 2.0 over OWL 1.0.   [10]
       (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 dc:date 1849.

P.T.O.

rec:book2 dc:title "The Woman in White" .
rec:book2 dc:creator "Wilkie Collins".
rec:book2 inv:price 950 .
rec:book2 dc:date 1859.

rec:book3 dc:title "Pilgrim's Progress" .
rec:book3 dc:creator "John Bunyan".
rec:book3 inv:price 1750 .
rec:book3 dc:date 1678 .

rec:book4 dc:title "Emma" .
rec:book4 dc:creator "Jane Austen".
rec:book4 inv:price 1825 .
rec:book4 dc:date 1815 .

rec:book5 dc:title "Pride and Prejudice" .
rec:book5 dc:creator "Jane Austen" .
rec:book5 inv:price 109 .
rec:book5 dc:date 1813 .

(i)   write a SPARQL query to return the number of titles written by each author.   [4]
(ii) write a SPARQL query to return the titles published before 1850.   [4]
(iii) show the results for both the queries in a tabular form.   [2]

JP 5. (a) "Semantic Web is an extension of the traditional Web 1.0" - illustrate the significance of Semantic Web over Web 1.0.   [10]

(b) What is reasoning? Briefly discuss the various reasoning tasks.   [2+8]

DB 6. Answer *any four* of the following.   [4*5=20]
    (a) Discuss the SPARQL Select form with an example.
    (b) Briefly, describe RDF blank node.
    (c) Briefly, define open world vs. closed world assumptions.
    (d) Describe rdfs:domain and rdfs:range with examples.
    (e) Briefly, discuss UML.