JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL-2023

B.Tech-VI Semester (CS/IT)

COURSE CODE (CREDITS): 20B1WCI732 (2) MAX. MARKS: 25

COURSE NAME: From Graph to knowledge Graph

COURSE INSTRUCTOR: Ravindara Bhatt MAX. TIME: 1 Hour 30 Min

Note: *All questions are compulsory.*

1. Fill in the blanks for these statements. **[CO3] [1 * 5 = 5 Marks]**
   a. Rule-based IE techniques are expected to have ____ precision and ___recall.
   b. ____ and _____ are the measures of centrality in a graph.
   c. One of the concrete sub problems in IE from natural-language text is defining the domain of interest. One simple approach to do it automatically is by setting any _____ phrase as a candidate entity and any _____ phrase as a candidate relation.
   d. ____ and _____ are the practical applications of NER
   e. _____ is a graph database, that supports RDF

2. Which of the following is/are true? Justify your answer?**[CO3] [1 * 5 = 5 Marks]**
   a. Classes in RDF Schema are much like classes in object oriented programming languages.
   b. Ontology is a formal description of knowledge as a set of concepts within a domain and the relationships that hold between them.
   c. N triples are designed to be human readable.
   d. Graphs G and G' are isomorphic without being equivalent in the RDF Universe
   e. Ontologies are machine-readable and Interoperable

3. **[CO3] [1+ 1 +1 +2 = 5 Marks]**
   a. Ordinarily, focused crawlers (and many other types of crawlers as well) take as traditional inputs such
      as some starting (or seed) URLs and, possibly, a topic description (e.g., a list of keywords). Suggest at least two domains for the application areas of the focused crawlers.
   b. List the main design elements of a focused crawler.
   c. Compare and contrast Best-First crawlers and Semantic crawlers.

d. Draw the practical architecture for Named Entity Recognition (NER).

4. **[CO2] [2+ 1+ 1 +1 = 5 Marks]**
   a. Compare and contrast Resource Description Framework (RDF)and labeled property graphs
   b. Give an example of k-Vertex Cover.
   c. Using Menger's Theorem, show that $k(G) = k'(G)$ when G is 3-regular,
   d. How do you find the minimum dominating set of a graph?

5. **[CO2] [2+ 2 +1 = 5 Marks]**

   a. Let us define a new term called edge isomorphism as follows: Two graphs G1 and G2 are edge isomorphic if there is a one-to-one correspondence between the edges of G1 and G2 such that two edges are incident (at a common vertex) in G1 if and only if the corresponding edges are also incident in G2. Construct an example to prove that edge-isomorphic graphs may not be isomorphic.
   b. Prove that in a connected graph G a vertex v is a cut-vertex if and only if there exist two (or more) edges x and y incident on v such that no circuit in G includes both x and y.
   c. Compute the line graph of a graph G, written L(G) for Figure 1.

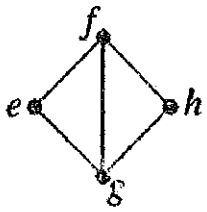

Figure 1: Graph G