19 UCS181 - VAIBHAV

The LNM Institute of Information Technology
Department: Computer Science and Engineering
Knowledge Representation, Reasoning and Applications (CSE 0326)
End-Term Examination

Time: 180 mins   **Date: 13/Dec/2021**   **Max. Marks: 180**

Instruction: *1. All the questions are compulsory.*
                 2. Make and State Appropriate Assumptions if and when required.

Q.1.
(A) Explain the distinctive characteristics of the following KRR Schemes using an example for each [Marks 7]. And give one best suited application for each scheme [Marks 5].
(i) Logic (PL and FOPL) Based KRR
(ii) Fuzzy Logic Based KRR
(iii) Frame-Based KRR
(iv) CBR Based KRR
(v) Semantic-net Based KRR [Total Marks 5 * (7 + 5) = 60].
(B) Bring out the difference between Knowledge Based Reasoning and Statistical Data Based Reasoning using an example for each. [Marks 10].
(C) Bring out the difference between Monotonic Reasoning and Non-monotonic Reasoning using an example for each. [Marks 10]
(D) Bring out the difference between Semantic-net Based KRR and Taxonomy Based KRR using an example for each. [Marks 10]

Q2. Case Study: Consider a Point-of-Sale (PoS) workbench of a Super Market Store. Each buyer is likely to have **zero or more** (i) Large sized items (LI), (ii) Medium sized items (MI) and (iii) Small sized items (SI) which will be on the workbench and will be put into **one more bags** after the payment. The rules of bagging are as follows: (a) Not more than 3 LI should be at the bottom of a bag; (b) Not more than 5 MI should be above LI in any bag; (c) Not more than 7 SI should be above MI in any bag; assume that there are enough number of empty bags available. Write FOPL based rules (using OPS5 like language) to bag an arbitrary number of LI, MI and SI. [Marks 40].
Show execution trace for (i) zero LI, zero MI and zero SI; (ii) 4 LI, 6 MI and 8 SI; [Marks 10]

Q3. Case Study: Assume a competition of Autonomously Driven Toy Car in the Central Plaza (CP) of LNMIIT. The toy car needs to complete a "200 meter long white-path with a few smooth curves" painted on the floor of CP. The car has sensors and a controller loaded with fuzzy logic rules to autonomously drive it. Make suitable assumptions and design the fuzzy logic rules. [Marks 40]