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MCSE-003

MCA (Revised)

Term-End Examination, 2019

MCSE-003 : ARTIFICAL INTELLIGENCE AND KNOWLEDGE MANAGEMENT

Time : 3 Hours] [Maximum Marks : 100

Note : Question **No. 1** is **compulsory**. Attempt **any three** questions from the rest of the questions.

1. (a) Represent the following statement into predicate logic : [5]

   (i) "John cut down the tree with an axe."

   (ii) "Some employees are sick today."

   (b) Show that $(P \Rightarrow Q) = (P \rightarrow Q) \Lambda (Q \rightarrow P)$. [4]

   (c) Prove the following by forward chaining method (10 <= 3 + 9) [5]

   (d) Write a program in Prolog for finding the greatest common divisor of two Positive integers. [6]

(e) Define Skolemisation Term, Convert following formula into Prenex normal form $\exists x(\forall y\, Friend\,(x,y) \Lambda \neg(\exists y\ Foe(y,x)))$ [5]

(f) Define CNF and DNF. [5]

(g) What is fuzzy logic and explain union, intersection operation on fuzzy set. "Food is cheap" represent this statement into fuzzy logic. [5]

(h) What is meant by Truth Maintenance System (TMS) ? Discuss TMS with block diagram. [5]

2. (a) What is the purpose of generating a DNF in first order predicate logic ? Convert this to DNF form $((X \Rightarrow Y) \wedge \neg X) \Rightarrow \neg Y$ [6]

(b) Test the validity of following Argument :

"If milk is black, then every cow is white. If every cow is white then, it has four legs. If every cow has four legs, then every buffalo is white and brisk. The milk is black. Therefore the buffalo is white. [6]

(c) List any four applications on First order predicate logic. [4]

(d) Which of the following is Tautology or contradiction : [4]

(i) $[(p \wedge q) \rightarrow (q \vee r)] \leftrightarrow [p \rightarrow \sim r]$

(ii) $(p \rightarrow q) \wedge (q \rightarrow r) \rightarrow [p \rightarrow r]$

3. (a) Define fuzzy inference system ? What are the main steps in Fuzzy inference system ? Make an inference system for food management system. [10]

(b) What is intelligent Agent ? Explain the working of Model based agents and Goal based agents systems ? [10]

4. (a) Explain the importance of an expert system. What are various knowledge representative techniques used in Expert system ? [8]

(b) Identify the type of ambiguity in each of the following sentences : [6]

(i) He was not sure that he has taken a drink.

(ii) Vidushi broke her glasses.

(iii) I saw the boy with the telescope.

(c) Discuss about Expert shell. Explain the architecture and reasoning technique used for expert system COMPASS. [6]

5. (a) Write a recursive LISP program to find the n^{th} element of a list. [5]

(b) Differentiate between the supervised learning and inductive learning. [5]

(c) Explain Non-monotonic Reasoning with the help of example. [5]

(d) Draw the Semantic Network of sentence "John gave lecture to his students". [5]

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