B. Tech.

(SEM. VI) EXAMINATION, 2008-09

ARTIFICIAL INTELLIGENCE

Time : 3 Hours]   *[Total Marks : 100*

Note :   Attempt all questions.

1   Attempt any **four** parts of the following: 5×4=20

   (a)   Explain Intelligence and Artificial Intelligence. How do you distinguish between the two ? Give different definition based on various forms of Intelligence.

   (b)   Distinguish between Heuristics and Algorithms. Support your answer with the help of example.

   (c)   Solve the water Jug Problem with the capacity of the two Jugs of 3 and 4 liters with no marking in them. Given a water supply with a large storage using these TWO Jugs, how can you separate 2 liters of water. Alos draw the tree, representing the transition of state.

   (d)   Explain the A* alogrithm and illustrate the overestimation and underestimation of heuristics.

(e) What are semantic Nets? Explain with example how is the knowledge represented.

(f) Discuss the basic elements of natural language processing.

2   Attempt any **two** of the following :   10×2=20

(a) Describe the difference between language understanding and language generation with suitable examples.

(b) What do you understand by Parsing ? Draw Parser tree and define the grammers.

A boy ate the Frog.

(c) What do you understand by term Linguistics? What are the levels of knowledge used in language understanding.

3   Attempt any **two** of the following :   10×2=20

(a) Explain the Wang's Algorithm and Verify the following"

(i) $p \vee q, p \rightarrow s, q \rightarrow s \Rightarrow s$

(ii) $p \rightarrow (q \rightarrow r) \Leftrightarrow (p \wedge q) \rightarrow r.$

(b) Explain the first order Predicale logic (FOL). Explain how well formed formules (WFF) are defined.

Rewrite the following sentences in FOL.

(i) Coconut is a biscuit.

(ii) Mary is a child who takes coconut.

(iii) John loves children who take biscuits.

(iv) For a triangle ABC it is given that the sum of the interior angle is 180 degree.

(c) Explain the Resolution Algorithm and explain the soundness and completeness of resolution alogrithms. Prove the following goal with the help of knowledge base.

(i) $p \vee q$

(ii) $\neg q \vee t$

(iii) $\neg p \vee s$

(iv) $\neg s.$

goal : $t.$

4 Attempt any **two** of the following.   10×2=20

(a) What is an expert System? Explain the following methodologies.

(i) Probabilistic techniques.

(ii) Fuzzy based techniques.

(b) Explain the Dempster Shafer theory for uncertainty management in expert System with suitable example.

(c) Discuss the advantage of expert system Architecture based on decision tree and production rules.

5 Attempt any **two** of the following: **10×2=20**

   (a) Descibe the various designing steps of Pattern recognition System in detail with suitable example.

   (b) Describe the symbolic description and structured description and their advantages and disadvantages over system design.

   (c) Explain the various list manipulation functions of LISP with example.

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