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M.C.A.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2013-14

ARTIFICIAL INTELLIGENCE

Time : 3 Hours Total Marks : 100

Note :-(l) Attempt all questions. (2) Be precise in your answer.

1. Attempt any four parts of the following: (5x4=20)

(a) Define Artificial Intelligence formulated by Haugeland. Also define Artificial Intelligence in terms of human performance.

(b) Elaborate the approaches for AI with example. Also give any two applications of AI in detail.

(c) What do you mean by Intelligent Agent ? What are the various types of Intelligent Agent ?

(d) Represent the following sentence in the Predicate form "All the children like sweets".

(e) Elaborate on the agent communication method by action.

(f) What do you understand by Natural Language Processing ?

2. Attempt any four parts of the following: (5x4=20)

(a) Define in your own words the "State Space Search". When would Best First Search be worse than simple Breadth First Search ?

(b) Discuss how a heuristic function helps in the search technique. Explain with a suitable heuristics function for TIC TAC TOE problems.

(c) What is A* algorithm ? Under what conditions A* algorithm produces optimal solution or always guarantees a solution.

(d) Explain Predicate Logic with the help of suitable examples.

(e) Explain genetic algorithm as a local search. Write in detail the online search agent working using depth first exploration.

(f) Describe alpha-beta pruning and give the other modifications to the minmax procedure to improve its performance.

Attempt any two parts of the following: (10x2=20)

3 .(a) How can resolution be used to show that a sentence is valid ? Draw the Conceptual Dependency (CD) representation for the sentence : John Punched Bill.

(b) Consider the following sentences:

- John likes all kinds of food
- Apples are food
- Chicken is food

Anything anyone eats and isn't killed by is food

- Bill eats peanuts and is still alive
- Sue eats everything bill eats

(i) Translate these sentences into formulas in predicate logic

(ii) Prove that John likes peanuts using backward chaining

(iii) Convert the formulas of a part into clause form

(iv) Prove that John likes peanuts using resolution.

(c) Explain how Bayesian statistics provide reasoning under various kinds of uncertainty.

Attempt any two parts of the following: (10x2=20)

(a) Discuss the concept of Supervised Learning and describe an algorithm for the same.

(b) Describe Naive Baye's Model for learning.

(c) Write note on Reinforcement Learning.

Describe any two parts of the following: (10x2=20)

(a) Design principles of pattern recognition system.

(b) Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA).

(c) Support Vector Machine (SVM).