CSPE16

RAMAIAH
INSTITUTE OF
TECHNOLOGY

SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch : **B.E. – Computer Science & Engineering**	**Semester**	: **VI**
Subject : **Artificial Intelligence**	**Max. Marks**	: **100**
Subject Code : **CSPE16**	**Duration**	: **3 Hrs**

Instructions to the Candidates:
- Answer one full question from each unit.
- Support your answers with examples and diagrams where ever necessary.

UNIT - I

1. a) Write the algorithm of the simple problem solving agent. Using the example of the water jug problem explain how formulating the problems as a state space search would be beneficial. — CO1 (10)

    b) State any two definition of Artificial Intelligence as in Literature. Discuss briefly the properties of task environment of agents. Give suitable examples and tabular description to support your answers. — CO1 (10)

2. a) List any four agent types. Given an example for each type. — CO1 (08)

    b) Write the algorithms of Iterative Deepening search and Depth Limited Search. Compare their performance based on the parameters of completeness, time, space and optimality. — CO2 (12)

UNIT – II

3. a) Write the BNF Grammar of a sentence in propositional Logic. Define the terms equivalence, validity and satisfiability as applied to propositional logic using suitable examples. — CO3 (10)

    b) Justify the need for online search agents. Write the LRTA* algorithm and comment on its efficiency. — CO2 (10)

4. a) Define refutation completeness. Illustrate the procedure of converting the sentence $B_{1,\,1} \Leftrightarrow (P_{1,2}\,VP_{2,1})$ into Conjunctive Normal form in case of propositional logic. — CO3 (08)

    b) Justify the effectiveness of heuristic search algorithms when compared to the uniformed search methods. Briefly explain the working of the A* algorithm and the factors which contribute strongly to the performance of the algorithm. — CO2 (12)

UNIT - III

5. a) Develop an ontology and knowledge base that allow us to reason about the digital circuit given below. — CO3 (10)
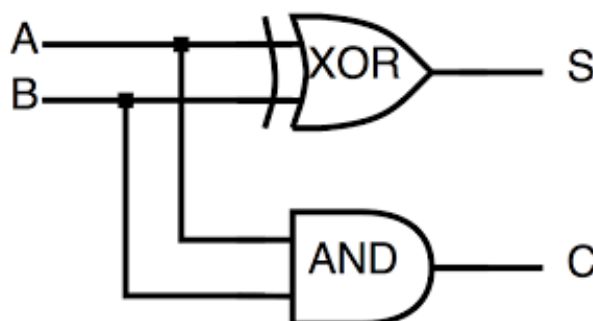
b) Represent the following sentences in first-order logic, using a consistent vocabulary(which you must define):   CO3   (10)
   i. Some students took French in spring 2001.
   ii. Every student who takes French passes it.
   iii. Only one student took Greek in spring 2001.
   iv. The best score in Greek is always higher than the best score in French.
   v. Every person who buys a policy is smart.
   vi. No person buys an expensive policy.
   vii. There is an agent who sells policies only to people who are not insured.
   viii. A person born in the UK, each of whose parents is a UK citizen or a UK resident, is a UK citizen by birth.
   ix. Politicians can fool some of the people all of the time, and they can fool all of the people some of the time, but they can't fool all of the people all of the time.

6. a) Consider the following problem: "The law says that it is a crime for an American to sell weapons to hostile nations. The country Nono, an enemy of America, has some missiles, and all of its missiles were sold to it by Colonel West, who is American. "Prove that `West is a criminal' using forward chaining algorithm and show the generated proof tree.   CO3   (12)

   b) Every sentence of first-order logic can be converted into an inferentially equivalent CNF sentence. Illustrate the procedure by translating the sentence "Everyone who loves all animals is loved by someone,"   CO3   (08)

UNIT – IV

7. a) Write the GRAPHPLAN Algorithm and explain how it uses backward search to extract a plan. Formulate the Planning graph for the spare tire problem.   CO4   (10)

   b) State the difference in supervised, unsupervised and reinforcement learning methods using suitable examples.   CO4   (10)

8. a) For the case study of Toothache, cavity, Catch world, explain the concept of Inference using full joint Distribution.   CO5   (10)

   b) Write the Decision tree learning algorithm. Draw a decision tree for the problem of deciding whether to move forward at a road intersection, given that the light has just turned green.   CO4   (10)

UNIT - V

9. a) List the major objectives of resource allocation in project management. If there were 4 projects which require 5 employees, calculate the length of chromosome representation and depict the Crossover, Mutation process.   CO5   (12)

   b) Justify with reasons, how Ant Colony Optimization algorithm can be ported on to travelling salesman problem.   CO5   (08)

10. a) Is it necessary to consider the discourse and pragmatic context in which sentences are uttered? List the number of important relationships phrases and parts of their discourse contexts with relevant examples..   CO5   (10)

    b) List and explain spell checking techniques and Soundex algorithm for effective spell checking.   CO5   (10)

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