**C14-R3: AI AND NEURAL NETWORK**

**NOTE:**

1. **Answer question 1 and any FOUR questions from 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

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

**1.**

a) Distinguish between declaration and procedural knowledge. Give any two examples.
b) Differentiate between the A* and AO* algorithm. In what type of AI applications are they used?
c) Write the steepest hill climbing algorithm. When does this algorithm fail to find a solution?
d) Explain the concept of horizon effect and secondary search in context of minimax search.
e) Differentiate between deterministic and nondeterministic parsing.
f) What are the conditions to be satisfied to find an optimal path to a goal, if any path to a goal exists?
g) Define the terms: knowledge acquisition, knowledge manipulation, knowledge organization and knowledgebase representation.

**(7x4)**

**2.**

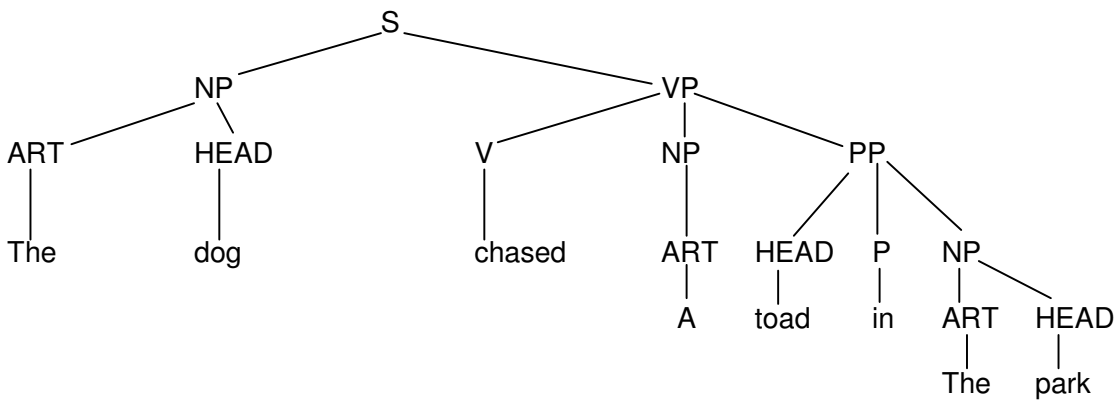
a) Write the steps in converting coefficients in propositional calculus to conjunction of clauses.
b) Write the algorithm for constraint satisfaction, and explain how it is used to solve cryptoarithmatic problems.
c) Write first four steps of Trace while executing the constraint satisfaction for the following cryptoarithmatic problem

```
  S E N D
+ M O R E
----------
M O N E Y
```

**(6+6+6)**

**3.**

a) Explain perceptron learning algorithm. Compare it with other learning methods.
b) Express the following tree in list representation.




c) Explain the term fuzzy distance.

**(7+7+4)**

**4.**

a) What type of reasoning is used for following problems? Why?
   i) Problem of symbolic integration.
   ii) Proving theorems
   iii) Performing logical deduction

b) State the difference between pattern recognition and image understanding.

c) Explain, how the rule based deduction system enhances the efficiency of a system's performance.

**(6+6+6)**

**5.**

a) Write a LISP code which accepts two lists as inputs and returns the appended list.

b) Write a Prolog code to define clauses for relations: grandparents, parents and children. Prove, if somebody is a father of father of x, he will be a grandfather of x.

c) Explain the salient features of any other language apart from LISP and Prolog, which is used for writing AI programs.

**(6+6+6)**

**6.**

a) Give the conceptual dependency structure of the following:
   i) Ashok pushed the block with the help of a stick.
   ii) Milind has gone to park yesterday.
   iii) He ate ice cream with the help of spoon.

b) What are the components of natural language understanding system? Explain them in detail.

c) State the hypothesis used in MYCIN for the MB of the conjunction and disjunction.

**([3x2]+6+6)**

**7.**

a) Explain the architecture of computer vision system using a neat block diagram.

b) What is depth limited search. How it is better than simple depth first and breadth first search. Mention few applications where the depth limited search can be used.

c) What are the characteristics of the problem that are to be analyzed when choosing an appropriate method to solve the problem? Explain.

**(6+6+6)**