UNIVERSITY OF PUNE

[4364]-766

B. E. (Semester - I) Examination –2013

B.E(Computer) Engineering

Elective I-Artificial Intelligence

(Course 2008)

[Time : 3 Hours] **[Max. Marks:100]**

SECTION I

Q.1 a) Explain in detail what do you understand by task environment. [10]

Develop a PEAS description of task environment for each of the following agents

i) Satellite Image Analysis System

ii) Interactive English Tutor

b) What are intelligent agents? Describe in brief typical agent architecture. [8]

OR

Q.2 a) What is the role of Table driven Agent program in simple reflex agent? Write the architecture and function of model based reflex action [10]

b) What is Logic Programming? Explain forward and backward reasoning with and example. [8]

Q.3 a) How to evaluate the performance of an algorithm? How does uniform cost search use algorithm's performance? [8]

b) Explain the A* search algorithm with the help of a suitable example. [8]

How is it possible to avoid loops in A*.

OR

Q.4 a) Explain memory bounded heuristic search methods [8]

b) Give the initial state, goal state, successor function and cost function for the following and solve the problem using hill climbing : [8]

" You are given 3 jugs measuring 12 liters, 8 liters, 3liters and water tap. You can fill the jugs of empty them from one to another or on the ground. The goal is to measure exactly 1 liter water."

Q.5 a) Using CSP, explore the search space to solve the following cryptarithmatic problem. [8]

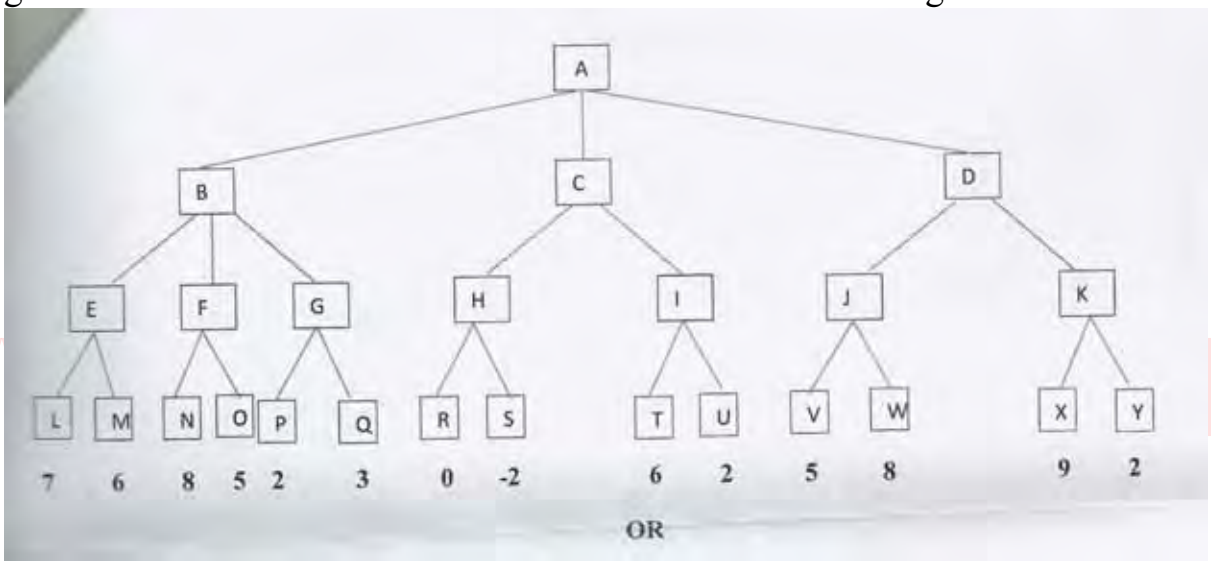
T A K E

\+ A

\+ C A K E

K A T E

b) What is alpha beta cut-off? Explain the concept with the help of the given game tree. What nodes would not need to be examined in the given tree? [8]



OR

Q.6 a) Explain the minimax algorithm to determine the optimal strategy for MAX to decided the best first move. [8]

b) Using CSP, explor the search space to solve the following cryptarithmatic problem [8]

N O

\+ N O

Y E S

SECTION- II

Q.7 a) what is semantic net? Explain how it is used to represent Inheritance. [8]

b) Explain how planning problem is expressed in STRIPS. [10]

(use Air Cargo transport problem as an example)

OR

Q.8 a) How can knowledge expressed in predicate logic be converted into clause from? Convert the following statements to clause form. [10]

i) Every child loves candy

ii) Anyone who loves candy is not a nutrition fanatic

iii) Anyone who eats any pumpkin is a nutrition fanatic

iv) Anyone who buys any pumpkin either carves it or eats it

v) John bys pumpkin

b) Explain planning with State Space Search using suitable example [8]

Q.9 a) Explain fuzzy set and crisp set. Mention applications of fuzzy logic. [8]

b) What are the basic axioms of probability? Why are they reasonable? [8]

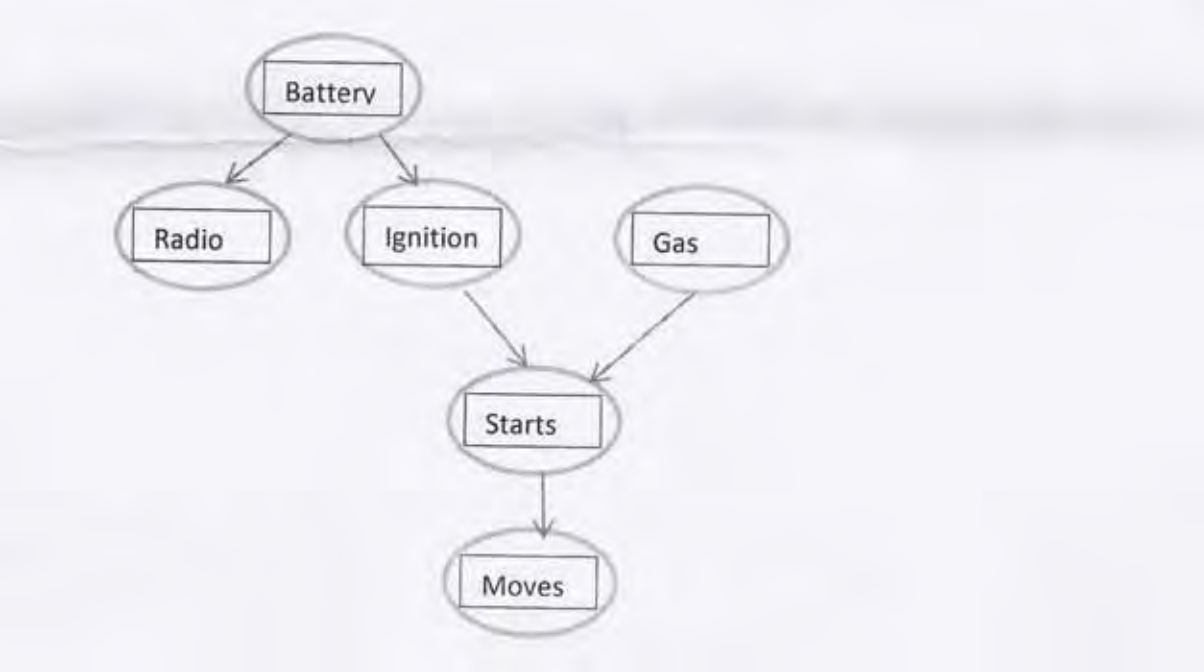
OR

Q.10 a) What are the basic inference tasks that must be solved in a generic [8]

Temporal model.

b) Consider the network for car diagnosis. Each variable(radio, Battery etc) [8]

is a boolean where true value indicates that the corresponding aspect of the vehicle is in working order.



1. Extend the network with Boolean variables Icy weather and Starter Moteor.
2. Give reasonable conditional probability tables for all nodes.
3. How many independent values are contained in the joint probability distribution for eight Boolean nodes, assuming that no conditional independence relations are known to hold them.
4. How many independent probability values does your network table cotain?

Q.11 a) Explain the basic characteristics of an expert system. [8]

b) Show syntactic parse for the following English statements : [8]

i) The big boy hit the little boy

ii) John ran.

OR

Q.12 a) What is parsing? Draw the parse tree for the following sentences. [8]

1. A student deleted my file

2. John asked Mary to print the file.

b) Explain all the steps in a NLP with an example. [8]