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Artificial Intelligence **EAUC 461** **Comprehensive Exam**
Duration :180 Mins Max marks : 40 Weightage : 40% Date : 4-1-06
Nature of Exam : Closed Book

ANSWER ALL QUESTIONS

1. Three married couples come to a river bank A. There is a boat on bank A that can carry at most two persons. All the six persons want to cross the river and reach bank B using the boat but there are certain conditions to be observed.
   i) No lady wants to row the boat.
   ii) No lady wants to travel in the boat with a man other than her husband
   iii) No lady wants to be left alone on a bank.
   iv) No lady wants to stay on the bank with another man when her husband is not there unless she has the company of another lady.
   v) No man wants to row the boat more than three times.

   a. Give a possible solution to this problem
   b. Write a state space representation of the above problem indicating different states, operators and conditions for using the operators. **5M**

2. Explain the technique of Simulated Annealing with the algorithm and its significance as an AI technique. **3M**

3. In Knowledge Representation what is the significance of facts and representation, how are these values interrelated? **3M**

4. Consider the following statements
   i) Whoever can read is a literate
   ii) Dolphins are not literate
   iii) Some Dolphins are intelligent

   Proove the following statement : Some who are intelligent cannot read **5M**

5. What are Semantic nets ? Give the semantic net representation for the following
   i) Every batter hit a ball
   ii) All the batters like the pitcher **3M**

6. Show the Conceptual Dependency representation for the following
   i) John ate ice cream with a spoon
   ii) Since smoking can kill you I stopped. **4M**

P.T.O

7. Explain Winston's learning problem **3M**

8. Explain the significance of a multilayer perceptron and how it overcomes the problem encountered by a single layered perceptron. **3M**

9. Write a LISP program to find the maximum of three numbers where the three numbers are entered by the user from the keyboard. **3M**

10. Write short notes on the following
    - i) Different types of AI architecture
    - ii) Expert system shells
    - iii) One application of neural networks
    - iv) What do you mean by a two ply game ? Is it possible to have more than two ply games.

8M

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Artificial Intelligence **EAUC 461** **Test 2(Open book)**

Duration : 50 Mins Max marks : 20 Weightage : 20% Date : 18-12-05

ANSWER ALL QUESTIONS

1. Suppose we want to use a semantic net to discover relationships that could help in disambiguating the word "bank" in the sentence

   John went downtown to deposit his money in the bank

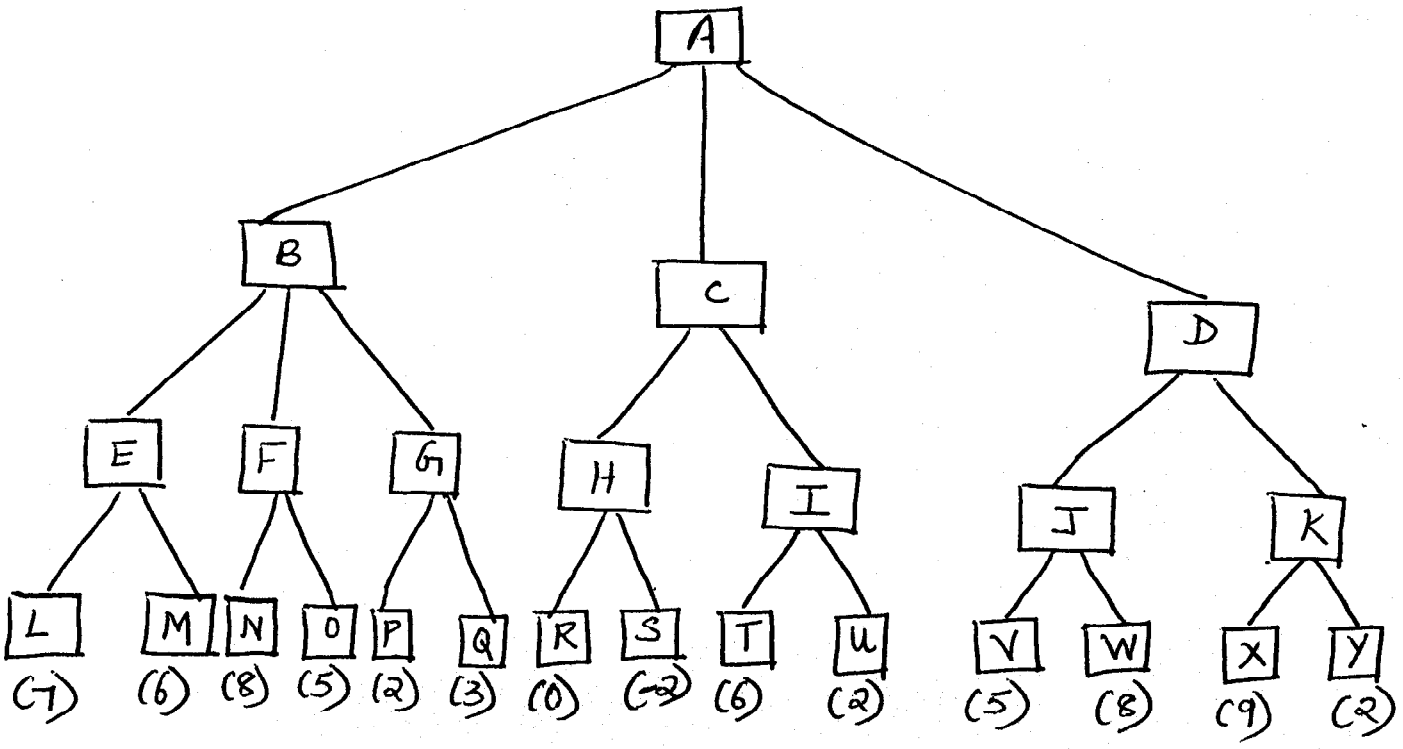
   The financial institution meaning for bank should be preferred over the river bank meaning.

   a) Construct a semantic net that contains representations for the relevant concepts. 2 marks

   b) Show how intersection search could be used to find the connection between the correct meaning for bank and the rest of the sentence more easily than it can find a connection with the incorrect meaning. 1 marks

2. Construct a script for filling gas in a gas station 4 marks

3. Construct the following game tree in which the static scores are all from the first players point of view.



a) Suppose the first player is the maximizing player, what move should be chosen. And what is the score at this node 1 marks
b) What nodes would not need to be examined using ά-β pruning procedure 1 marks
c) Why does search in a game playing program always proceed forward from the current position rather than backward from the goal state ? 1 mark
d) Is min-max a depth first or a breadth first procedure ? Explain 1 marks

4. Give short notes for the following
a) Significance of the certainty factor
b) Applications of fuzzy logic
c) Learning with and without a teacher signal (2 X 3 = 6 marks)

5. Compare the working of the back propagation algorithm with respect to competitive learning. 3 marks

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Artificial Intelligence EAUC 461 Test 1(Closed Book)

Duration : 50 Mins Max marks : 20 Weightage : 20% Date : 10-11-05

1. Define Artificial Intelligence and give three Applications of Artificial Intelligence 2 marks

2. Define the different categories of production systems giving examples for each 4 marks

3. Explain the working of the A* algorithm 4 marks

4. Represent the following sentences using predicate logic
a) Everyone in the world is loved by atleast one person
b) Brothers are siblings
c) A first cousin is a child of the parents sibling
d) A person born in the UK, each of whose parents is a UK citizen or a UK resident is a UK citizen by birth 1 X 4 = 4 marks

5. Convert the following to clause form
Everyone who loves all animals is loved by someone 3 marks

6. Give the output of the following
a. (reverse '(1(2 3)4))
b. (last '(9876))
c. (member '2 '(123)) 0.5 X 3 = 1.5 marks
d. Write a LISP program to find the area of a triangle where A=1/2 * b * h
1.5 marks

****ALL THE BEST ****

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Artificial Intelligence **EAUC 461** **QUIZ(Closed Book)**

Duration : 20 Mins Max marks : 10 Weightage : 10% Date : 9-11-05

Name : **ID No :**

A

Note each answer carries 0.5 marks

1. Give two areas where expert systems are used
   a.
   b.

2. The term given to the difficulty of exploring in the search space because of the large number of search options is called _____

3. Use of AI to understand a language and answer queries is called _____.

4. Two computer languages used commonly in AI programming are
   a.
   b.

5. The test used to check the success of an AI system designed by Alan Turing is called the _____.

6. Name the famous AI systems used to
   a. analyze organic compounds and determine their structure _____
   b. analyze strains of bacteria in a blood sample _____

7. LISP supports _____ rather than numeric data

8. The traveling salesman problem uses the _____ technique

P.T.O

9. A _____ production system is one in which the application of a rule does not prevent the later application of a rule which could have been applied in the first place where the first rule was applied.

10. A _____ is a flat area of a search space in which the whole set of neighboring states have the same value.

11. Cryptographic puzzles are an example of _____ technique.

12. A specific kind of attribute which is guaranteed to take on a unique value is called a _____.

13. The symbols used for there exists is _____ and for all is _____ in predicate logic.

14. A form of representation in predicate logic where quantifiers are separated from the rest of the formula is called _____.

15. In a representation like
$\forall x$: grandparent _of(S2(x),x)
The term S2 is called _____.

16. _____ is an application of using predicate logic in natural language understanding.

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