

**BITS, Pilani – Dubai Campus**  
Knowledge Village, Dubai  
Second Semester 2006 – 07

Course Number & Title	:	EAUC461 – Artificial intelligence
Component Name	:	Comprehensive Examination (Closed Book)
Weightage	:	40 %
Duration	:	3 hours
Date & Day	:	22-5-2007, Tuesday
Max Marks	:	40

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**NOTE : ALL QUESTIONS CARRY EQUAL MARKS**

1. What is the significance of planning, how is it different from problem solving ?  
Write a STRIPS representation to bake a cake
2. Explain the following terms PARTIAL ORDER PLAN, GRAPHPLAN, SATPLAN.
3. What is meant by certainty factors. What are the different ways in which they can be chained when there are many uncertainties involved.
4. What is learning? Explain the significance of learning in AI. Explain the significance of Discovery
5. Explain the following with respect to robotics
  - a. Applications of Robotics
  - b. Different programming languages used in robotics.
6. Explain the working of the Hopfield network
7. What is constraint satisfaction technique? What are the different ways in which problems with constraints can be solved ?
8. Represent the following statements in predicate logic
  - a. People don't do things that cause them to be in situations they don't like
  - b. It is safe to assume a movie is American unless explicitly told so.
9. Compare the hill climbing technique with simulated annealing. What are the different features that decide on the working of the hill climbing technique.  
Explain with a neat figure.
10. Give short notes on the following
  - a. Greedy search techniques
  - b. Bayesian Networks

\*\*\*\*\* ALL THE BEST \*\*\*\*\*

# BITS, PILANI - DUBAI CAMPUS KNOWLEDGE VILLAGE, DUBAI

Artificial Intelligence EAUC 461 Test 2(Open Book)  
 Duration : 50 Mins Max marks : 20 Weightage : 20% Date : 29-4-07

- Note : 1. Answer all questions.  
 2. Refer only to RB1 and RB2

1. "A travel agent asks you to design an expert system to help people choose where to go on holiday. Discuss whether this might be a suitable problem for an expert system, and say how you might start acquiring the necessary expert knowledge." 3M

2. Write LISP functions

- a) to evaluate the absolute value of value. The absolute value is given as  
 $abs(X) = -X$  if  $X$  is  $-ve$   
 $abs(X) = X$  if  $X$  is  $+ve$
- b) Calculate the length of an hypotenuse where  $HYP = \sqrt{X^2 + Y^2}$  2 + 2 M

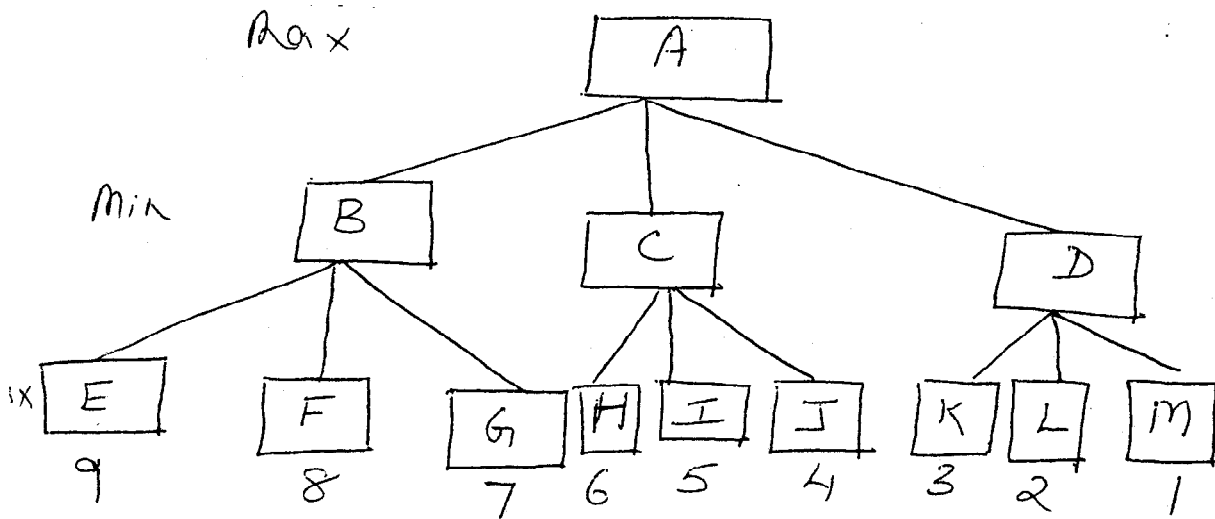
3. Explain the process of learning in a perceptron. What is the function of a hidden layer in the back propagation algorithm. 2 + 1M

4. Create a decision tree for buying a car. Could a decision tree be constructed in different ways ? What are the different factors to be constructed when creating a decision tree. 3M

5. Unify the following pairs of expressions.

- a)  $P(X,Y)$  and  $P(A,Z)$   
 b)  $P(X,X)$  and  $P(A,B)$   
 c)  $Ancestor(X,Y)$  and  $Ancestor(Bill,father(Bill))$   
 d)  $A(X,Y)$  and  $C(X,Z)$  4M

6. For the given tree which nodes are pruned and why ? 3M



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Artificial Intelligence

EAUC 461

Test 1(Closed Book)

Duration : 50 Mins

Max marks : 20

Weightage : 20% Date : 11-3-07

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1. What is meant by a local beam search? Discuss a techniques that uses the local beam search. 1+2M
2. Consider the missionaries and cannibals problem. Where three missionaries and three cannibals want to cross a river in a boat and the boat can hold only one or two people at a time. The condition to be followed is that at no time can the number of cannibals outnumber the number of missionaries. Give the state space for this problem as a hill climbing problem. Now if an additional constraint is added that any person can travel on the boat only twice how would the state space change. 2+2M
3. What are heuristics? How are they useful in search problems? How do you decide on an appropriate heuristic for a given problem? 1+1+2M
4. How is the graph representation for a search different from a tree representation? 2M
5. How would you define an agent? How does the agent interact with the environment? 1+1M
6. Discuss how the problem of tic-tac-toe would be solved if solved as a DFS and with breadth first search. Which technique would be better in terms of memory and space requirements? 2+1M
7. Define the term Artificial Intelligence? Discuss why it is very relevant in today's world. 1+1M