

GUJARAT TECHNOLOGICAL UNIVERSITY
ME - SEMESTER-II • EXAMINATION – SUMMER - 2017

Subject Code: 2722314

Date: 29/05/2017

Subject Name: Artificial Intelligence For Information Technology

Time: 02:30 PM To 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a)

- (i) The Generate-and-test algorithm is a depth first search procedure. True or False? Justify.
- (ii) How does AND-OR graph differ from one for searching an OR graph?

07

(b) Suppose that the letters A,B, etc represent states in a problem. The following moves are legal:

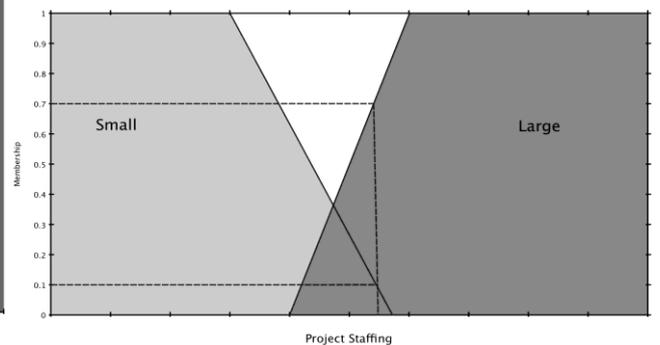
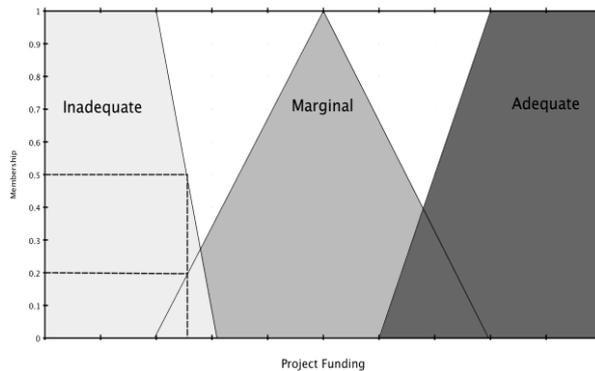
07

- A to B and C
- B to D and E
- C to F and G
- D to I and J
- I to K and L

Start state: A Goal state: E , J.

Conduct a depth first search of the space.

Q.2 (a)



07

On X-axis project funding and project staffing, each black dot represent 10%,20%,30%,40%,50%,60%,70%,80%,90%,100%. Assume data if necessary.Y axis represent Membership.

Inputs are project_funding = 35% and project_staffing = 60%. Find the fuzzy values for these crisp values by using the membership functions of the appropriate sets. The sets defined for project_funding are **inadequate**, **marginal** and **adequate**. The sets defined for project_staffing are **small** and **large**. Write the rules which takes “project funding” and “project staffing” as input and gives output “the risk” as low,normal,high. Perform fuzzification. How to perform defuzzification?

(b) Trace the constraint satisfaction procedure solving the following cryptarithmic problem:

07

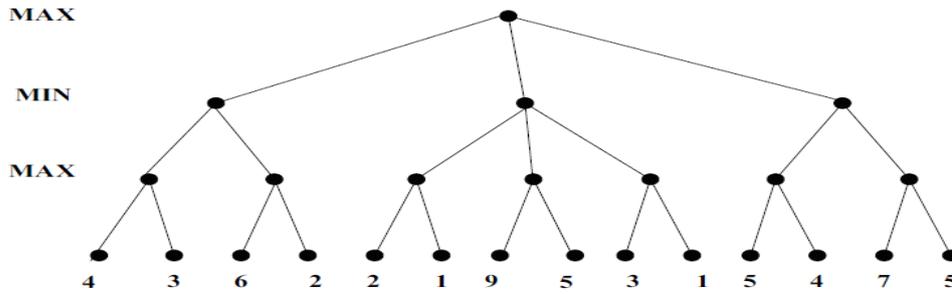
$$\begin{array}{r}
 \text{TWO} \\
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 \hline
 \text{FOUR}
 \end{array}$$

OR

(b)

Alpha beta pruning. Example

07



Consider the above game tree in which static scores are all from first player's point of view. The first player is maximizing player, What move should be chosen? What nodes would not be examined using the alpha-beta pruning procedure?

Q.3 (a) While working with A* algorithm, h' is estimator of h . What happens if h' underestimates h ? **07**

What happens if h' overestimates h ? Explain.

(b) How does Resolution in predicate logic and propositional logic differ? **07**

Assume the following facts.

1. Steve only likes easy courses.
2. Science courses are hard.
3. All the courses in the basketweaving department are easy.
4. BK301 is a basketweaving course.

Use resolution to answer the question, "What course would Steve like?"

OR

Q.3 (a) Consider Hill Climbing, Consider the blocks world problem, **07**

A
H
G
F
E
D
C
B

H
G
F
E
D
C
B
A

Initial state

Goal State

Operators available are – (pick up one block and put it on the table; pick up one block and put it on another one.) Which heuristic functions can be used? What kind of problem can arise and how it can be solved?

(b) What is the use of propositional logic and predicate logic? **07**

Translate following into predicate logic.

- 1) John likes all kinds of food.
- 2) Apples are food.
- 3) Anything anyone eats and isn't killed by is food.
- 4) Bill eats peanuts and is still alive.

Q.4 (a) What is joint probability? What is Marginal probability? Explain Bayes Nets. **07**

(b) Construct semantic net representations for the following: **07**

1. Pomperian(Marcus) Blacksmith(Marcus)
2. Mary gave the green flowered vase to her favorite cousin.

OR

Q.4 (a) Explain Co-relation and regression with example. **07**

(b) How forward reasoning and backward reasoning differ? Explain with example. **07**

Q.5 (a) What is rote learning? Explain induction. **07**
(b) How supervised and unsupervised learning differ? Explain single layer perceptron and classification. **07**

OR

Q.5 (a) What are the advantages of an expert system? Write the steps in developing an expert system. **07**
(b) Write about Neural Network Applications. Which application will use multilayer neural network? **07**
