

22/6/22 (E)
6th Sem

Exam.Code:0924
Sub. Code: 6854

2062
B.E. (Information Technology)
Sixth Semester
IT-604: Artificial Intelligence

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit. Any missing or misprinted data may be assumed suitably.

x-x-x

I. Attempt the following:-

- Define alpha-cut in fuzzy set theory with the help of an example.
- What is a *Local Maximum* in Hill climbing? Can best direction to move be determined in a *Local Maximum*?
- Explain Tangled Hierarchies.
- Explain *False Positive* and *False Negative*.
- What is Explanation Based learning?

(5x2)

UNIT - I

II. a) Give an example of a problem for which breadth-first search would work better than depth-first search. Give an example of a problem for which depth-first search would work better than breadth-first search. [5]

b) Consider the following 8-puzzle problem:

"The 8-puzzle is a square tray in which are placed, eight square tiles. The remaining ninth square is uncovered. Each tile has a number on it. A tile that is adjacent to the blank space can be slid into that space. A game consists of a starting position and a specified goal position. The goal is to transform the starting position into the goal position by sliding the tiles around." [5]

Analyse the problem with respect to the following problem characteristics:

- Is the problem decomposable into a set of (nearly) independent smaller or easier sub problem?
- Can solution steps be ignored or undone?
- Is the universe predictable?

III. a) Compare A* and AO* algorithm with the help of suitable example. [5]

b) Explain the concept of SCRIPT with the help of suitable example. [5]

IV. a) Distinguish between forward Vs Backward reasoning. In what scenario they may be used. [5]

b) Define following fuzzy set operation and compare them with classical logic. [5]

i) UNION

ii) INTERSECTION

P.T.O.

(2)

UNIT - II

V. Design a Decision tree based on following data:

[10]

RID	age	income	student	credit_rating	Class: buys_computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle_aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle_aged	low	yes	excellent	yes
8	youth	medium	no	fair	no
9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle_aged	medium	no	excellent	yes
13	middle_aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

VI. a) The monkey-and-bananas problem is faced by a monkey in a laboratory with some bananas hanging out of reach from the ceiling. A box is available that will enable the monkey to reach the bananas if he climbs on it. Initially, the monkey is at A, the bananas at B, and the box at C. The monkey and box have height *Low*, but if the monkey climbs onto the box he will have height *High*, the same as the bananas. The actions available to the monkey include Go from one place to another, Push an object from one place to another, *Climb Up* onto or *Climb Down* from an object, and *Grasp* or *Ungrasp* an object. Grasping results in holding the object if the monkey and object are in the same place at the same height. [7]

- i. Write down the initial state description.
- ii. Write down STRIPS-style definitions of the six actions.

b) Elaborate partial order planning with the help of suitable example. [3]

VII. a) What are the issue in Multi Agent Planning environment. Suggest possible remedies also. [5]

b) Discuss the Architecture of Expert System. What is the significance of *Inference Engine*? [5]