Paper Name: Artificial Intelligence

MSc 3rd Semester FM=30

PART-A

Q1. Answer any **five** questions 5 X 2 =10

i) Prove that height (F) =1 where F is normal fuzzy set

ii) Let us consider the fuzzy set M on the set U={a,b,c,d,e} described as

M=0.375/a +0.5/c + 1.0/d + 0.875/e;

Find out support(M), core(M)?

iii) Consider two fuzzy sets:

P=Beautiful flowers=0.3/jasmine + 0.9/rose + 1.0/lotus + 0.7/daffodil

Q=Fragrant flowers= 1.0/jasmine + 1.0/rose + 0.5/lotus + 0.2/daffodil

Compute fuzzy sets R

Where R=OR (P,Q)

iv) Define convex fuzzy set with the help of an example

v) Consider a dataset with five objects a=1, b=2, c=4, d=5, e=6; There are two clusters C1: {a,b} and C2: {c, d, e}; Compute the distances between C1 and C2 using single linkage, complete linkage and avg, linkage

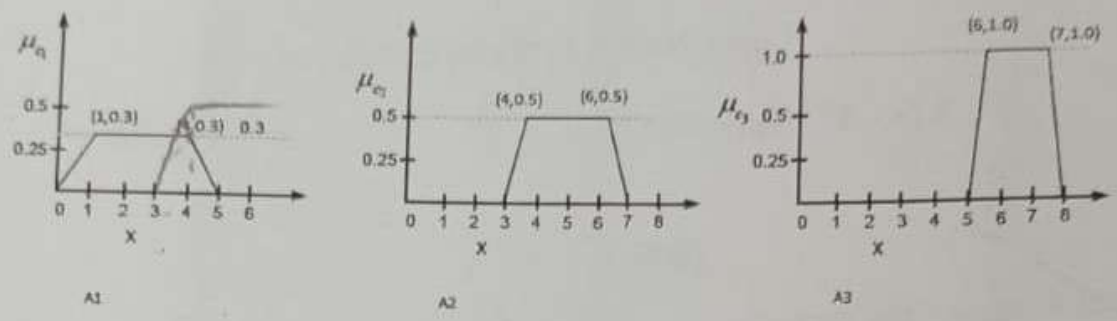
vi) State the differences between partitioned clustering and hierarchical clustering algorithm

PART-B

Q2. Answer any **four** questions 4 X 5=20

a) Define the agents in artificial intelligence. State the differences between Uniform-cost Search Algorithm and Iterative deepening depth-first Search (1+4)=4

b) There are three fuzzy sets A1, A2, A3 in the following figure. Find out the defuzzified value of the aggregated fuzzy set (A1,A2,A3) using centre of gravity method.



c) Explain A* algorithm with the help of an example

d) Find the root of decision tree using CART algorithm. Please refer Table 1.

Table 1:

Day	Outlook	Temperature	Humidity	Wind	Decision: (Golf Play possible)
1	Sunny	Hot	High	Weak	No
2	Sunny	Hot	High	Strong	No
3	Overcast	Hot	High	Weak	Yes
4	Rain	Mild	High	Weak	Yes
5	Rain	Cool	Normal	Weak	Yes
6	Rain	Cool	Normal	Strong	No
7	Overcast	Cool	Normal	Strong	Yes
8	Sunny	Mild	High	Weak	No
9	Sunny	Cool	Normal	Weak	Yes
10	Rain	Mild	Normal	Weak	Yes
11	Sunny	Mild	Normal	Strong	Yes
12	Overcast	Mild	High	Strong	Yes
13	Overcast	Hot	Normal	Weak	Yes
14	Rain	Mild	High	Strong	No

e) Find out the class label of the following sample (X) (refer Table 1) using Naïve Bayesian classifier

X = {Outlook= Rain, Temperature=Hot, Humidity=High, Wind=Weak }

f) State the working principle of k-means algorithm with the help of a flowchart