JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION, OCTOBER 2018

B.Tech (ECE) 7th Semester

Dr. Vikas Baghel

Course Code: 18B1WEC733 MAX. MARKS: 25
Course Name: Machine Learning and Data Analytics-I
Course Credits: ~~04~~ 03 MAX. TIME: 1.5 Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1 **(a)** What are the requirements for a data set to be suitable for Factor Analysis? [2.5] [CO1,CO2,CO4]

(b) Explain varimax rotation with example. [2.5]

Q2 **(a)** Explain single linkage agglomerative hierarchical clustering with example. [2.5] [CO1,CO2,CO3]

(b) Draw tree diagram (Dendrogram) for given data set: [2.5]

x_1	x_2
0.5	-0.2
1.2	0.8
-0.3	0.4
1.5	1.3

Q3 **(a)** Suppose we have several objects (4 types of medicines) and each object has two attributes as shown in table below. Group given objects in to $k = 2$ group of medicine based on the two attributes using k-means clustering method. [3] [CO1,CO2,CO3]

Object	Attribute-1 (weight index)	Attribute-2 (pH)
Medicine A	1	1
Medicine B	2	1
Medicine C	4	3
Medicine D	5	4

(b) What are the advantages and disadvantages of k-mean clustering? [2]

Q4 **(a)** You are stranded on a deserted island. Mushrooms of various types grow widely all over the island, but no other food is anywhere to be found. Some of the mushrooms have been determined as poisonous and others are not. You have the following data to consider. [CO1,CO3, CO4, CO5]

Mushroom type	Not Heavy	Smelly	Spotted	Smooth	Edible
A	1	0	0	0	1
B	1	0	1	0	1
C	0	1	0	1	1
D	0	0	0	1	0
E	1	1	1	0	0
F	1	0	1	1	0
G	0	0	0	1	0
H	0	1	0	0	0
U	0	1	1	1	?

i. What is the entropy of Edible? [1]

ii. With the help of mushrooms (A-H), build a decision tree to classify mushrooms as poisonous or not. [5]

iii. Classify mushroom "U" using the decision tree as poisonous or not poisonous. [1]

(b) What is artificial neural network? What are the limitations of artificial neural network. [1+2]