JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

B.Tech-VIII Semester (BI)

COURSE CODE (CREDITS): 18B1WCI843 (3) MAX. MARKS: 35

COURSE NAME: Data Analytics

COURSE INSTRUCTORS: Ekta Gandotra MAX. TIME: 2 Hours

Note: (a)*All questions are compulsory.*
(b)Marks are indicated against each question in square brackets.
(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

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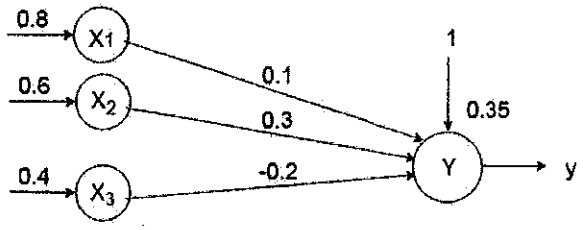
Q1. CO-3 Obtain the output of the neuron y for the network shown in the figure using activation functions as

a. Binary Sigmoidal [3.5]

b. Bipolar Sigmoidal [3.5]



Q2. CO-2 a. How does a Support Vector Machine work? Explain with the help of an example. [4]

b. Explain the principle of the gradient descent algorithm using a suitable example. [3]

Q3. CO-3 a. Give a method to find the optimal value of k for k-NN algorithm. [3]

b. Given the following dataset, find the class of the test sample using k-NN algorithm. Take k=1 and k=3. Use L2 Norm for distance computations. [4]

Height (CM)	Weight (KG)	Class
167	51	Underweight
173	64	Normal
172	65	Normal
174	56	Underweight
169	58	Normal
168	53	Underweight

Test Sample

Height (CM)	Weight (KG)	Class
170	57	?

P.T.O.

Q4. CO-4 a. Consider the following 10 data points (with (x, y) representing locations). Use k-Means Clustering algorithm to find the three cluster centers after the first iteration. Take the initial cluster centers as C1(1,5), C2(4,1), C3(8,4) and use Euclidean distance as distance function. [4]

A1(2, 4), A2(2, 6), A3(5, 6), A4(4, 7), A5(8, 3), A6(6, 6), A7(5, 2), A8(5, 7), A9(6,3), A10(4,4).

b. Explain the advantages of using Random Forest. Differentiate between Bagging and Boosting ensemble learning methods. [3]

Q5. CO-4 a. Find the frequent item sets and generate the association rules for the following dataset using Apriori algorithm. Take minimum support=2 and minimum confidence = 50%. [5]

TID	Itemsets
T1	A, B
T2	B, D
T3	B, C
T4	A, B, D
T5	A, C
T6	B, C
T7	A, C
T8	A, B, C, E
T9	A, B, C

b. What is a dendrogram in hierarchical clustering? Explain with the help of an example. [2]