Question Paper

Exam Date & Time: 24-Nov-2018 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES

SECOND SEMESTER MASTER OF ENGINEERING - ME (BIG DATA AND DATA ANALYTICS)

Machine Learning for Big Data [BDA 610]

Marks: 100 **Duration: 180 mins.**

END SEMESTER DEGREE EXAMINATION NOVEMBER 2018

Answer all the questions.

1) What is Artificial Neural Network (ANN)? Explain the computational models for Artificial Neural Networks? (10)

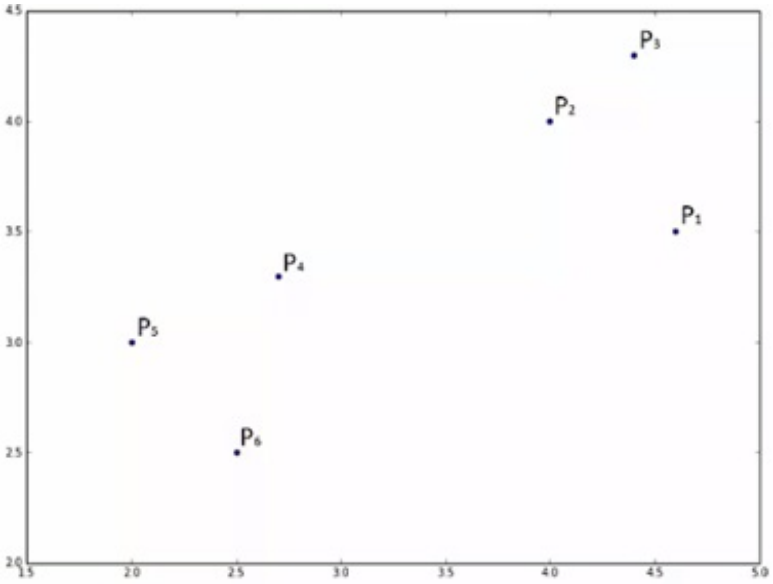
2) a) With suitable diagram, briefly describe the architecture of a single layer perceptron network? Also write the limitation of a single layer perceptron network. (6)

b) What is stochastic gradient descent? (4)

3) a) How can dissimilarity or distance between two clusters be measured? Explain (4)

b) Write the taxonomy of clustering techniques. Briefly explain about each type. (6)

4) For the data points shown in figure (10)



(a) Show how do dendrograms works? (5 Marks)

(b) How can you decide number of clusters from dendrograms? (5 Marks)

5) What is reinforcement learning? Explain with suitable example for the same. (8)

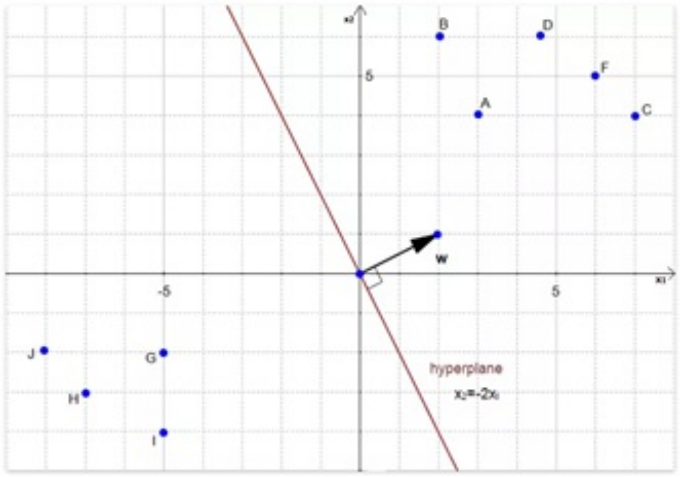
6) Show the convolutional, pooling and fully connected layers model for the image given below (12)

1	-1	1
-1	1	-1
1	-1	1

7) Compute the following with reference to the figure given below: (10)

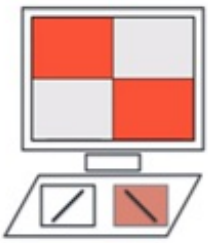
(a). Distance from a point A to the hyperplane (6 Marks)

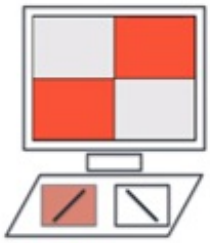
(b). Margin of the hyperplane (4 Marks)



8) Realize the logical OR and logical AND functions by McCulloch-Pitts neuron model. (10)

9) Assume that you have a computer with 2 x 2 pixel resolution and a keyboard with only two alphabets / and \. Develop an image recognition classifier software, to display the pixels as shown in the figure, when you press two alphabets / and \. (10)





10) With suitable diagram define the following terms (10)

(a). Support vectors (2 Â½ Marks)
(b). Maximum margin (2 Â½ Marks)
(c). Maximum margin hyperplane (2 Â½ Marks) +
(2 Â½ Marks for the diagram)

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