Question Paper

MANIPAL UNIVERSITY

SCHOOL OF INFORMATION SCIENCES (SOIS)
SECOND SEMESTER MASTER OF ENGINEERING - ME(Big Data and Data Analytics)
DEGREE EXAMINATION- APRIL / MAY 2017
Thursday, 20, 2017
Time : 10:00 AM - 1:00 PM

Machine Learning [BDA 602]

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

Answer all the questions.

1) Write the definition of Machine Learning. Give any four computer applications for which machine learning approaches seem appropriate. (2+8 Marks) (10)

2) Describe the method of choosing a Representation for the Target Function for the machine learning system. (10)

3) Define the terms Most General Hypothesis and Most Specific Hypothesis. (4 Marks) (10)
Write the most general and most specific hypothesis for the following training examples (6 Marks)

Example	*Sky*	*AirTemp*	*Humidity*	*Wind*	*Water*	*Forecast*	*EnjoySport*
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

4) A. Define Version Space and Consistent Hypothesis in concept learning (2+3) (10)
B. Write the list-then-elimination algorithm to obtain version space. (5)

5) Obtain the decision tree for the following training examples using ID3 algorithm. (10)

Instance	Classification	a_1	a_2
1	+	T	T
2	+	T	T
3	−	T	F
4	+	F	F
5	−	F	T
6	−	F	T

6) Explain how bagging and boosting methods used in construction of a committee. (10)

7) Determine the MAP hypotheses by using Bayes theorem to calculate the posterior probability of each candidate hypothesis. (10)

8) Write the purpose of Maximum Margin Classifiers in Support Vector Machines. (10)

9) What are the different activation functions used in Artificial Neural Network learning system? Explain with suitable example for each. (10)

10) With suitable diagram, briefly describe the architecture of a single layer perceptron network? Also write the learning algorithm for a single layer perceptron network. (10)

(5+5 Marks)