

B.E Comp. VIII CBSGS  
 Elective-III M/c Learning  
 R-2012

12.5.17  
 Q.P. Code :16171

[Time: 3 Hours]

[ Marks:80]

Please check whether you have got the right question paper.

**N.B:**

1. Question no 1 is compulsory.
2. Attempt any three questions out of remaining five questions.
3. Assume any suitable data wherever required but justify the same.

- Q.1
- A. What is machine learning? Explain how supervised learning is different from unsupervised learning. 05
  - B. Explain Bayes theorem. 05
  - C. What are the elements of reinforcement learning? 05
  - D. Describe the two methods for reducing dimensionality. 05

- Q.2
- A. The following table shows the midterm and final exam grades obtained for students in a database course. 10

Midterm exam (x)	Final exam (y)
72	84
50	63
81	77
74	78
94	90
86	75
59	49
83	79
65	77
33	52
88	74
81	90

Use the method of least squares using regression to predict the final exam grade of a student who received 86 on the midterm exam.

- B. Explain the steps in developing a machine learning application. 10

- Q.3
- A. For a SunBurn dataset given below, construct a decision tree. 10

Name	Hair	Height	Weight	Location	Class
Sunita	Blonde	Average	Light	No	Yes
Anita	Blonde	Tall	Average	Yes	No
Kavita	Brown	Short	Average	Yes	No
Sushma	Blonde	Short	Average	No	Yes
Xavier	Red	Average	Heavy	No	Yes
Balaji	Brown	Tall	Heavy	No	No
Ramesh	Brown	Average	Heavy	No	No
Swetha	Blonde	Short	Light	Yes	No

B. What is Support Vector Machine (SVM)? How to compute the margin? 10

Q.4 A. Explain Hidden Markov Models. 10

B. Use Principal Component analysis (PCA) to arrive at the transformed matrix for the given matrix A. 10

$$A^T = \begin{matrix} 2 & 1 & 0 & -1 \\ 4 & 3 & 1 & 0.5 \end{matrix}$$

Q.5 A. Explain how Back Propagation algorithm helps in classification. 10

B. For the given set of points identify clusters using complete link and average link using agglomerative clustering. 10

	A	B
P1	1	1
P2	1.5	1.5
P3	5	5
P4	3	4
P5	4	4
P6	3	3.5

Q.6 Write short notes on any two:-

A. Temporal difference learning

B. Logistic regression

C. Machine learning Applications

20