Machine learning

Q.P. Code :16172

[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. Define Machine Learning? Briefly explain the types of learning.	05
	b. What is independent component analysis?	05
	c. What are the issues in decision tree induction?	05
	d. What are the requirements of clustering algorithms?	05

Q.2 a. The values of independent variable x and dependent value y are given below: **10**

X	Y
0	2
1	3
2	5
3	4
4	6

Find the least square regression line y=ax+b. Estimate the value of y when x is 10.

b. What are the steps in designing a machine learning problem? Explain with the checkers problem.   **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 the goal of the Support Vector Machine (SVM)? How to compute the margin?   **10**

Q.4 a. For the given set of points identify clusters using complete link and average link using agglomerative   **10** clustering.

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

b. What is the role of radial basis function in separating nonlinear patterns.   **10**

Turn over .

Q.5 a. Use Principal Component analysis (PCA) to arrive at the transformed matrix for the given matrix A. **10**

A^T = 2 1 0 -1
4 3 1 0.5

b. What are the elements of reinforcement learning? **10**

Q.6 Write short notes on any two **20**
a. Logistic regression
b. Back propagation algorithm
c. Issues in Machine Learning