BTS-V(SS)-09-22-1092 Reg. No. | | | | | | | | |

B

B.Tech. Degree V Semester Special Supplementary Examination September 2022

CS 19-202-0507 MACHINE LEARNING

(2019 *Scheme*)

Time: 3 Hours Maximum Marks: 60

Course Outcomes

On successful completion of the course, the students will be able to:

CO1: Explain various learning approaches and concepts of supervised learning.
CO2: Compare the different dimensionality reduction techniques.
CO3: Make use of theoretical foundations of decision trees to identify best split and Bayesian classifier.
CO4: Make use of clustering algorithms.
CO5: Identification of classifier models for typical machine learning applications.
CO6: Combine algorithms and analyze different algorithms.

Bloom's Taxonomy Levels (BL): L1 – Remember, L2 – Understand, L3 – Apply, L4 –Analyze, L5 – Evaluate, L6 – Create

PO – Programme Outcome

PART A

(Answer *ALL* questions)

		(8 × 3 = 24)	Marks	BL	CO	PO
I.	(a)	Compare over fitting and under fitting.	3	L2	1	1,2
	(b)	Differentiate testing data, validation data and training data.	3	L2	1	1,2
	(c)	Discuss the methods by which dimensionality reduction can be implemented.	3	L1	2	1,2
	(d)	Differentiate methods for hierarchical clustering.	3	L2	4,5	1,2
	(e)	Differentiate univariate and multivariate trees.	3	L2	3	1,2
	(f)	Compare clustering and classification	3	L2	4,5	1,2
	(g)	Differentiate bagging and boosting.	3	L2	6	1,2
	(h)	Compare Neural Networks and SVMs.	3	L2	5	1,2

PART B

(4 × 12 = 48)

II. Explain Naïve Bayes Classifier Algorithm. 12 L3 4,5 1,2,3

Consider the following dataset. Apply Naïve Bayes classifier on the dataset to predict whether the person plays cricket or not for the tuple X = (outlook: sunny, temperature: mild, humidity: normal, windy: false)

Outlook	Temperature	Humidity	Windy	Play?
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

OR

BTS-V(SS)-09-22-1092

			Marks	BL	CO	PO
III.	(a)	Discuss the different stages in machine learning	4	L1	1	1,2
	(b)	Discuss the types of machine learning.	8	L1	1	1,2
IV.		Assume points P1(2, 10), P2(2, 5), P3(8, 4), P4(5, 8), P5(7, 5), P6(6, 4), P7(1, 2), P8(4, 9). Cluster the following eight points into 3 clusters using K-Means Clustering. Explain the working of the algorithm and enumerate its limitations too.	12	L3	4,5	1,2,3, 4,5
		OR				
V.		Discuss PCA Algorithm with an example.	12	L1	2	1,2,3, 4,5
VI.		Demonstrate the working of decision trees to two levels with numeric calculations and equations. Explain with theory and mathematical notions behind this.	12	L3	3	1,2,3, 4,5

Item	Color	Category	Use	Class Label
1	R	S	D	Y
2	R	S	D	N
3	R	S	D	Y
4	Y	S	D	N
5	Y	S	I	Y
6	Y	U	I	N
7	Y	U	I	Y
8	Y	U	D	N
9	R	U	I	N
10	R	S	I	Y

OR

VII.	(a)	Discuss kernel functions for SVM.	5	L1	4,5	1,2,3
	(b)	Discuss SVM.	7	L1	4,5	1,2,3
VIII.	(a)	Discuss hidden Markov model and discrete Markov processes.	8	L1	6	1,2,3
	(b)	Differentiate model based and temporal difference learning.	4	L2	6	1,2,3
		OR				
IX.	(a)	Discuss back propagation algorithm.	5	L1	6	1,2,3
	(b)	Discuss activation functions.	7	L1	6	1,2,3

Bloom's Taxonomy Levels
L1 = 45%, L2 = 40%, L3 = 15%.

***