Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 6011

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024
Sixth Semester
Information Technology
U19IT619 – INTRODUCTION TO MACHINE LEARNING
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What are the roles of artificial intelligence in research?	2	K2	CO1
2.	Write the machine learning applications.	2	K2	CO1
3.	Illustrate the multiple random variable.	2	K2	CO2
4.	A jar has 1000 coins, of which 999 are fair and 1 is double headed. Pick a coin at random, and toss it 10 times. Given that you see 10 heads, what is the probability that the next toss of that coin is also a head?	2	K3	CO2
5.	List out the advantages of support vector machines.	2	K1	CO3
6.	You're asked to build a random forest model with 10000 trees. During its training, you got training error as 0.00. But, on testing the validation error was 34.23. What is going on? Haven't you trained your model perfectly?	2	K3	CO3
7.	Define regression. How does polynomial regression model works?	2	K1	CO4
8.	What is logistic regression?	2	K1	CO4
9.	How to find the minimum support value in Apriori Algorithm?	2	K2	CO5
10.	Define clustering. List out the applications of clustering algorithm.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Construct and explain Artificial Neural network structure.	13	K3	CO1
		(OR)			
	b)	Explain the different types of machine learning with examples.	13	K3	CO1
12.	a)	Let X be a discrete random variable with the following PMF	13	K4	CO2

$$P_X(x) = \begin{cases} 0.1 \text{ for } x = 0.2 \\ 0.2 \text{ for } x = 0.4 \\ 0.2 \text{ for } x = 0.5 \\ 0.3 \text{ for } x = 0.8 \\ 0.2 \text{ for } x = 1 \\ 0 \text{ otherwise} \end{cases}$$

i. Find the range R of the random variable X.
ii. Find $P(X \leq 0.5)$
iii. Find $P(0.25<X<0.75)$
iv. Find $P(X = 0.2|X<0.6)$

(OR)

	b)	Explain the general MLE method for estimating the parameters of a probability distribution.	13	K4	CO2
13.	a)	Explain weighted K-nearest Neighbor algorithm.	13	K2	CO3
		(OR)			
	b)	Explain about Naïve Bayes algorithm for continuous attributes with examples.	13	K2	CO3
14.	a)	Explain the difference between linear and logistics regression with example.	13	K3	CO4
		(OR)			
	b)	How to construct Regression tree and write procedure to construct regression tree with example.	13	K3	CO4
15.	a)	Explain briefly about unsupervised learning structure.	13	K3	CO5
		(OR)			
	b)	Recall the steps involved in Partitional clustering algorithm.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Consider the training dataset given in the following table. Use Weighted k-NN and determine the class. Test instance (7.6, 60, 8) and K= 3.	15	K5	CO3

S.No	CGPA	Assessment	Project Submitted	Result
1	9.2	85	8	Pass
2	8	80	7	Pass
3	8.5	81	8	Pass
4	6	45	5	Fail
5	6.5	50	4	Fail
6	8.2	72	7	Pass
7	5.8	38	5	Fail
8	8.9	91	9	Pass

(OR)

b) Apply Appriori algorithm on the grocery store example with support threshold s = 33.34% and confidence threshold c = 60%, where H, B, K, C and P are different items purchased by customers. — 15 — K5 — CO5

Transaction ID	Items
T1	H,B,K
T2	H,B
T3	H,C,P
T4	P,C
T5	P,K
T6	H,C,P

i. Show all final frequent item sets.
ii. Specify the association rule that are generated.
iii. Show final association rules sorted by the confidence.
iv. Represent the transactions as graph.