PRESIDENCY UNIVERSITY
BENGALURU

School Of Computer Science and Engineering & Information Science

End-Term Examinations, Aug 2024

Odd Semester: 2023-24 (LATERAL ENTRY)

Course Code: CSE3001

Course Name: Artificial Intelligence and Machine Learning

Department: IST (AI/ML) & IV Sem

Date: 16/08/2024

Time: 9.30 am to 11.00 am

Max Marks:100

Weightage:50%

Instructions:

  (i)   *Read the all questionscarefully and answer accordingly.*
  (ii) *Do not write any matter on the question paper other than roll number.*

Q.No		Questions	Marks	CO	RBT
1	a.	Discuss the importance of knowledge representation in AI. What are the main challenges faced in this area?	4	CO1	L1
	b.	Why do we need Knowledge Presentation .Explain its Schemes?	6	CO1	L2
	c.	Define various types of Agents and their properties in detail.	10	CO1	L3
OR					
2	a.	Explain the difference between Semantics Networks and associative networks .	4	CO1	L1
	b.	Explain the Structure of Knowledge –based agent with architecture in detail.	6	CO1	L2
	c.	Define various types of Search algorithms and their properties in detail.	10	CO1	L3

Q.No		Questions	Marks	CO	RBT
3	a.	What are the key steps involved in the machine learning process.	4	CO2	L1
	b.	Explain Difference Between Artificial Intelligence and Machine Learning.	6	CO2	L2
	c.	Illustrate the concept of feature selection with an example of a real-world dataset. Describe the steps taken to select the most relevant features and the impact of this selection on the final model's accuracy.	10	CO2	L3
OR					
4	a.	What are categorical and continuous variables? Provide examples of each.	4	CO2	L1
	b.	Explain the Naive Bayes algorithm. What is the underlying principle that makes it 'naive'?	6	CO2	L2

	c.	Discuss about the Naive Bayes algorithm. How bayesien can be applied to classification problem for the given example.		CO2	

Type of family structure	Age group	Income status	Will they buy a car?
Nuclear	Young	Low	Yes
Extended	Old	Low	No
Childless	Middle-aged	Low	No
Childless	Young	Medium	Yes
Single Parent	Middle-aged	Medium	Yes
Childless	Young	Low	No
Nuclear	Old	High	Yes
Nuclear	Middle-aged	Medium	Yes
Extended	Middle-aged	High	Yes
Single Parent	Old	Low	No

(10, L3)

			Marks	CO	Level
5	a.	Define the role of a cost function in machine learning. Explain the types of Regression cost function.	4	CO3	L1
	b.	Explain the concept of the margin in SVM and how it is used to find the optimal hyperplane for classification.	6	CO3	L2
	a.	The table represents our data set. We have two columns — **Brightness** and **Saturation**. Each row in the table has a class of either **Red** or **Blue**. Use KNN Classification for predicting the class for a new sample when Brightness=20 and Saturation =35.Let assume K=5.	10	CO3	L3

BRIGHTNESS	SATURATION	COLOR
40	20	RED
50	50	BLUE
60	90	BLUE
10	25	RED
70	70	BLUE
60	10	RED
25	80	BLUE
20	35	?

OR

			Marks	CO	Level
6	a.	Expalin in detail about types of Support vector machines .	4	CO3	L1
	b.	Explain the basic concept of ensemble learning. How does combining multiple models lead to improved performance compared to individual models?	6	CO3	L2
	c.	Using this training data set , Define KNN algorithm to decide mostly likely colors for a new item with X=3 and Y =3. The distance between points is the actual distance on the X – Y plane.	10	CO3	L3

X	Y	Color
1	1	Red
1	3	Green
2	5	Blue
3	5	Green
4	1	Blue
4	4	Red

		5	3	Blue			
		5	4	Green			

7	a. What are the key challenges of clustering high-dimensional data?	4	CO4	L1
	b. Define K-Means Clustering Algorithm with suitable example.	6	CO4	L2
	c. Find the clusters using a single link technique. Use Euclidean distance and draw the dendrogram. 		I1	I2	I3	I4	I5
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I1	1.00	0.90	0.10	0.65	0.20
I2	0.90	1.00	0.70	0.60	0.50
I3	0.10	0.70	1.00	0.40	0.30
I4	0.65	0.60	0.40	1.00	0.80
I5	0.20	0.50	0.30	0.80	1.00		10	CO4	L3

OR

8	a. What is clustering in machine learning, and how does it differ from classification?	4	CO4	L1
	b. Use K means Clustering algorithm to divide the following data into two clusters K=2. 	X1	1	2	2	3	4	5
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X2	1	1	3	2	3	5		6	CO4	L2
	c. Find theAlgomerative clusters using a Average link technique. Use Euclidean distance and draw the dendrogram. 		a	b	c	d	e
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a	0	9	3	6	11
b	9	0	7	5	10
c	3	7	0	9	2
d	6	5	9	0	8
e	11	10	2	8	0		10	CO4	L3

9	a. Define applications of AI ?	4	CO1	L1
	b. Define Decision Tree . Illustrate the working of Decision tree algorithm .	6	CO2	L2
	c. Explain the difference between Bagging and boosting algorithms in detail.	10	CO3	L3

OR

a. Explain the components of Time Series data in detail.	4	CO4	L1
b. How can data sets will be evaluated , define their cluster validating measures using time series data.	6	CO4	L2
c. Find Algomerative clusters using a single and average linkage technique. Use Euclidean distance and draw the dendrogram.	10	CO4	L3

The row label for this block is 10.

	A	B	C	D	E	F
A	0					
B	5	0				
C	16	9	0			
D	11	20	13	0		
E	18	15	6	3	0	
F	10	16	8	10	11	0