6/2/24

Code No.: R22EC301PE | R22 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–M.TECH–I–Semester End Examinations (Regular) - February- 2024
AI&MACHINE LEARNING (PE-V)
(VLSI SD)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(10 Marks)**

1. a)	What do the coefficients in linear regression mean?	[1M]
b)	What is the best error measure for linear regression?	[1M]
c)	What is the main function of principal component analysis?	[1M]
d)	What is used for dimensionality reduction in machine learning?	[1M]
e)	Why do we use boosting?	[1M]
f)	List the popular statistical machine learning techniques.	[1M]
g)	List the types of problems in which artificial neural network can be applied.	[1M]
h)	Define the back propagation rule.	[1M]
i)	What is the main idea of genetic algorithm?	[1M]
j)	List some of the properties in fuzzy sets.	[1M]

PART-B **(50 Marks)**

2. a)	What do you mean by linear regression? Which applications are best modeled by linear regression?	[5M]
b)	Describe Bayes rule. Explain approximations that lead to Naive Bayes classifier.	[5M]
	OR	
3. a)	What is the goal of support vector machine? How to compute the margin?	[5M]
b)	Define decision tree learning. List and explain appropriate problems for decision tree learning.	[5M]
4.	Apply k-means algorithm and find centroids. Take A & B as a initial centroids A(1,2),B(9,10), C(8,6), D(5,5), E(3,3), F(6,1),G(2,2) H(2,8)	[10M]
	OR	
5. a)	Illustrate how dimensionality is reduced using PCA.	[5M]
b)	Differentiate supervised learning and unsupervised learning.	[5M]
6. a)	Explain the role of error function in boosting.	[5M]
b)	Why statistical theory is important in machine learning? What are the concepts of statistical learning?	[5M]
	OR	
7. a)	What are the ensemble methods used in machine learning? Explain bagging along with steps.	[5M]
b)	Differentiate between bagging, boosting and random forest.	[5M]

8. a) Demonstrate how back propagation algorithms help in classification. [5M]
   b) With neat sketch differentiate multilayer feed forward networks and recurrent neural networks. [5M]

OR

9. a) Write remarks on representation of feed forward networks. [5M]
   b) What is radial basis function network (RBFN)? Explain the training algorithm used for RBFN with fixed centers. [5M]

10. a) What is fuzzy logic? Explain component architecture of fuzzy logic with diagrammatic representation. [5M]
    b) Discuss the various steps in fuzzy inference process. [5M]

OR

11. a) Compare fuzzification with defuzzification. Explain different types of defuzzification methods. [5M]
    b) Discuss how can you apply genetic algorithm for economic load control dispatch. [5M]

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