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GIET UNIVERSITY, GUNUPUR - 765022
M. Tech (First Semester) Examinations, January - 2024
MPECS1031 - Machine Learning
(CSE)

Time: 3 Hrs

Maximum: 70 Marks

(The figures in the right hand margin indicate marks.)

PART – A**(2 x 10 = 20 Marks)**

Q.1. Answer all questions

CO# Blooms
Level

- | | | |
|---|-----|----|
| a. Discuss Reinforcement Learning with an example. | CO1 | K2 |
| b. Define function approximation. | CO1 | K2 |
| c. Differentiate between pre-pruning and post-pruning with relevant examples. | CO2 | K4 |
| d. What is Underfitting? Give an example. | CO2 | K1 |
| e. What is the use of Confusion Matrix? | CO3 | K1 |
| f. Define Recall and Precision with appropriate formulas. | CO3 | K2 |
| g. What is CNN in machine learning with example? | CO1 | K1 |
| h. What is the difference between ROC area and AUC? | CO2 | K4 |
| i. Write a short note on SVM. | CO4 | K1 |
| j. Why is ANN used? Discuss with an example. | CO4 | K1 |

PART – B**(10 x 5=50 Marks)**Answer **ANY FIVE** questionsMarks CO# Blooms
Level

- | | | | |
|--|----|-----|----|
| 2. a. Differentiate between supervised and unsupervised machine learning algorithm. Enumerate specific algorithms associated with both supervised and unsupervised learning. | 5 | CO1 | K4 |
| b. What is Machine Learning? How does Machine Learning Work? And What is Classification of Machine Learning. | 5 | CO1 | K1 |
| 3.a. Using the given dataset, calculate the entropy for the target class (Sports: Yes/No). Then, determine which attribute (Weather, Temperature, or Humidity) would be the better choice for the initial split in a decision tree based on information gain, and compute the information gain value for the chosen attribute. | 10 | C02 | K3 |

Weather	Temperature	Humidity	Sports
Sunny	Hot	High	No
Sunny	Hot	High	No
Overcast	Hot	High	Yes
Rainy	Mild	High	Yes
Rainy	Cool	Normal	Yes
Rainy	Cool	Normal	No
Overcast	Cool	Normal	Yes
Sunny	Mild	High	No

4. a. Explain the reasoning behind Random Forest being labelled as an Ensemble Method. Also, given the presence of Decision Trees, what advantages or circumstances lead to the utilization of Random Forest as a method? 10 CO3 K2
- 5.a. Differentiate between Overfitting and Underfitting. When we will use Elastic Net and Compare the L1 and L2 Regularization. 10 CO4 K4
6. a. Explain the Naïve Bayes Classifier, including an intuitive understanding of its mathematical basis. 10 CO4 K2
- 7.a. What is SVM in machine learning explain with diagram? What are its advantages? Discuss in detail. 10 CO1 K1
8. a. Artificial Neural Networks (ANNs) are inspired by biological neurons. Justify the statement and how do neurons function in the context of ANNs, what are the key motivations drawn from biology in designing these networks? 10 CO2 K2

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