22CMP212A

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(Second Semester)

Branch – **COMPUTER SCIENCE**

MAJOR ELECTIVE COURSE – I: MACHINE LEARNING AND APPLICATIONS

Time: Three Hours Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. What characterizes supervised machine learning?
   (i) Learning a model based on a set of labeled examples.
   (ii) Given an input; an estimation of a parameter is provided.
   (iii) Learning a model based on a set of unlabeled examples.
   (iv) Assigning a meaningful placement of an element.

2. High entropy means that the partitions in classification are
   (i) Pure (ii) Not pure (iii) Useful (iv) Useless

3. Identify the most commonly used measure of similarity.
   (i) Euclidean distance (ii) city-block distance
   (iii) Chebyshev's distance (iv) Manhattan distance

4. Indicate the simplest way to combine multiple classifiers is by giving all the learners equal weight.
   (i) Bagging (ii) Boosting
   (iii) Cascading (iv) Voting

5. Choose an alternative to cross-validation to generate multiple samples from a singlesample.
   (i) Randomization (ii) Replication
   (iii) Bootstrap (iv) Blocking

SECTION-B (15 marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 3 =15)

6. a What is Noise in Supervised Learning? Explain briefly.
   (OR)
   b Categorize Various Model Selection and Generalization in Supervised Learning.

7. a Give suitable examples for Sample, Observable & Unobservable Variables in Bayesian Decision Theory.
   (OR)
   b Determine Learning Rules from Data in Decision Trees.

8. a Explain Hierarchical Clustering.
   (OR)
   b Discuss Model Selection in HMM.

9. a What is Reinforcement Learning? Give example.
   (OR)
   b Distinguish between Bagging and Boosting.

Cont...

10. a List out the Factors, Response &Strategy of Experimentation.

(OR)

b Classify Randomization, Replication and Blocking.

SECTION-C (30 marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (5 x 6 =30)

11. a Categorize Different Machine Learning Applications with examples.

(OR)

b Illustrate Vapnik - Chervonenkis (VC) Dimension with example.

12. a Explain Association Rules & Apriori using Bayesian decision theory.

(OR)

b Classify Univariate Trees, Classification Trees and Regression Trees.

13. a Discuss K-Means Clustering.

(OR)

b Illustrate Hidden Markov Model.

14. a Categorize the Methods in Generating Diverse Learners.

(OR)

b Explain Error Correcting Output Codes.

15. a List out the Guidelines for Machine Learning Experiments.

(OR)

b Elucidate Cross Validation & its Methods in detail.

Z-Z-Z END