

ગુજરાત વિદ્યાપીઠ : અમદાવાદ
વ્યવસ્થાપન અને પ્રૌદ્યોગિકી વિજ્ઞાન વિદ્યાશાખા
કમ્પ્યુટર વિજ્ઞાન વિભાગ
માસ્ટર ઓફ કમ્પ્યુટર એપ્લીકેશન (M.C.A.)
સત્રાંત પરીક્ષા : નવેમ્બર-2023

પરીક્ષાર્થી ક્રમાંક

MCA-302 : Machine Learning (Elective Course-1)

તલ. 02/11/2023

સમય : 12-00 થી 02-30

વાર : ગુરુવાર

કુલગુણ : 60

- Que-1 (A) Answer the followings. (Any Five) 05**
1. A feature F1 can take certain value: A, B, C, D, E, & F and represents grade of students from a college. Here feature type is _____
(a) Nominal (b) Ordinal
(c) Categorical (d) Boolean
 2. What is collinearity?
 3. SVM is a supervised Machine Learning can be used for _____
(a) Regression (b) Classification
(c) Either a or b (d) None of These
 4. True/False: Reinforcement machine learning models are trained to make a series of decisions based on the rewards and feedback they receive for their actions.
 5. Which of the following is not machine learning?
(a) Artificial intelligence (b) Rule-based inference
(c) Both A and B (d) None of the above
 6. Application of Machine learning is _____
(a) email filtering (b) sentiment analysis
(c) face recognition (d) All of the above
 7. Which of the following is the branch of Artificial Intelligence?
(a) Machine Learning (b) Cyber Security
(c) Full-Stack Developer (d) Network Engineering
 8. The supervised learning problems can be grouped as _____.
(a) Regression (b) Classification
(c) Both a and b (d) None of a and b
- Que-1 (B) Answer the following (Any Two) 04**
1. Write the limitation of machine learning?
 2. What is feature scaling?
 3. What is the purpose of cross-validation in machine learning?
 4. What is overfitting, and how can you avoid It?
- Que-1 (C) Answer the following (Any One) 06**
1. What Are the Different Types of Machine Learning? Explain in detail with its real-time use cases
 2. Explain the Confusion Matrix with Respect to Machine Learning Algorithms. With proper example and interpretation.
- Que-2 (A) Answer the followings. (Any Five) 05**
1. The Bayes rule can be used in
(a) Solving queries (b) Increasing complexity
(c) Decreasing complexity (d) Answering probabilistic query
 2. If machine learning model output involves target variable then that model is called as
(a) descriptive model (b) predictive model
(c) reinforcement learning (d) all of the above
 3. Among the following options identify the one which is false regarding regression.
(a) It is used for the prediction (b) It is used for interpretation
(c) It relates inputs to outputs (d) It discovers casual relationships

4. Of the Following Examples, Which would you address using an supervised learning Algorithm?
 (a) given email labeled as spam or not spam, learn a spam filter
 (b) given a set of news articles found on the web, group them into set of articles about the same story.
 (c) given a database of customer data, automatically discover market segments and group customers into different market segments.
 (d) find the patterns in market basket analysis
5. Suppose you are given reviews of few netflix series marked as good, bad and okay. Classifying reviews of a new netflix series is an example of learning. (supervised, unsupervised)
6. _____ is an example of a non-parametric machine learning algorithm?
7. What is k in k-NN?
8. Define Precision.
- Que-2 (B) Answer the following (Any Two) 04**
1. When should you use classification over regression?
 2. Explain in brief : SVM
 3. How do you design an Email spam filter? Write in brief.
 4. How would you handle an imbalanced dataset?
- Que-2 (C) Answer the following (Any One) 06**
1. Write a detailed note on : Naive Bayes
 2. Write a detailed note on : kNN
- Que-3 (A) Answer the followings. (Any Five) 05**
1. Which of the following is not a supervised learning?
 (a) PCA (b) Naive Bayesian
 (c) Linear regression (d) Decision tree
 2. True/False : Logistic regression mainly used for Regression.
 3. Real-Time decisions, Game AI, Learning Tasks, Skill acquisition, and Robot Navigation are applications of (supervised learning, reinforcement learning, simple learning)
 4. For a regression line through the data, the vertical distance from each data point to the regression line is called residual. (i) Square the residual, and (ii) sum all of the squared errors together. This is the quantity that ordinary least squares seek to ?
 (a) minimize (b) maximize
 (c) increase (d) None of these
 5. A relationship is _____ when the points on a scatterplot follow a pattern but not a straight line. (linear, non-linear)
 6. Which of the following is a limitation of K-means clustering?
 (a) Sensitivity to the initial placement of cluster centroids (b) Inability to handle missing data
 (c) Inability to handle categorical data (d) All of the above
 7. Evaluation metrics is commonly used for regression problems.
 (a) Mean squared error (b) Precision, recall, and F1-score
 (c) R-squared (d) Mean absolute error
 8. What is the primary assumption made by the K-means clustering algorithm?
 (a) Clusters have a spherical shape (b) Clusters have similar densities
 (c) Clusters have similar densities (d) Clusters are linearly separable
- Que-3 (B) Answer the following (Any Two) 04**
1. Explain in brief, Sensitivity and Specificity.
 2. Give difference between regression and classification.
 3. Explain the difference between L1 and L2 regularization.
 4. Explain in brief Linear Regression.

- Que-3 (C) Answer the following (Any One) 06**
1. Explain Logistic Regression in detail with proper example, diagram and use cases.
 2. Explain in detail. k-means clustering.
- Que-4 (A) Answer the following (Any Five) 05**
1. True/False : PCA can be used for projecting and visualizing data in lower dimensions.
 2. Which of the following machine learning techniques helps in detecting the outliers in data?
(a) Classification (b) Clustering
(c) Anomaly detection (d) All of the above
 3. True/False : The backpropagation law is also known as the generalized Delta rule.
 4. True/False : The 1×1 convolutions in a CNN can help in dimensionality reduction.
 5. True/False : True error is defined over the entire instance space, and not just over training data.
 6. Which of the following is a hyper parameter in machine learning?
(a) Learning rate (b) Training data
(c) Test data (d) Validation set
 7. True/False: Dimensionality reduction algorithms are one of the possible ways to reduce the computation time required to build a model.
 8. True/False: In PCA the number of input dimensions is equal to principal components.
- Que-4 (B) Answer the following (Any Two) 04**
1. Briefly explain any four Application Areas of AI.
 2. What is MLP, explain in brief.
 3. Write a short note: pooling layer in CNN
 4. Make a comparison table of Machine Learning and Deep learning.
- Que-4 (C) Answer the following (Any One) 06**
1. What is CNN? Explain convolution operation with example and important layers of CNN.
 2. Write a detailed note on the dimensionality reduction and discuss Principal Component Analysis in detail.
