RAN-251100100501101

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B. Sc. (Computer Science) (Sem. - V) Examination October - 2025

Major - 1 - Machine Learning Using Python (TH)

Time: 1 Hours] **[Total Marks: 25**

સૂચના : / Instructions

(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book.

Seat No.:

Student's Signature

Q. 1. Answer the following. **(08)**

A. Answer any four. (MCQs) (04)

1. Which Pandas function is used to display the first 5 rows of a DataFrame?
   (A) df.tail( ) (B) df.show( )
   (C) df.head( ) (D) df.top( )
2. In Simple Linear Regression, the slope represents:
   (A) Intercept value
   (B) Change in Y for each unit change in X
   (C) Error term
   (D) Predicted Y when X=0
3. Decision Tree leaf node represents:
   (A) A question (B) A dataset split
   (C) Final decision/output (D) Training data
4. Which sutra of Lilavati explains the Pythagoras Theorem?
   (A) Sutra 1 (B) Sutra 13
   (C) Sutra 17 (D) Sutra 23
5. The Fl-score balances between:
   (A) Precision and Accuracy (B) Recall and Accuracy
   (C) Precision and Recall (D) Accuracy and RMSE
6. The general equation of Multiple Linear Regression is:
   (A) $Y = \beta0 + \beta1X + \varepsilon$ (B) $Y = \beta0 + \beta1Xl + \beta2X2 + ... + \beta nXn + \varepsilon$
   (C) $Y = mX + c$ (D) $Y = \log(X)$

B. Answer any four. (04)

1. In reinforcement learning, what is the term for the reward received after an action?
2. In KNN, what happens when the value of K is too large?
3. What does the slope represent in simple linear regression?
4. In supervised learning, what are the input-output pairs called?
5. Which type of pattern does unsupervised learning try to discover?
6. In clustering, what is the center of a cluster called in K-Means algorithm?

Q. 2. Answer the following **(12)**

A. Explain simple linear regression and show how to find the regression line equation with an example. (07)

OR

A. Differentiate between supervised learning and unsupervised learning with suitable examples. (07)

B. Describe clustering in machine learning and explain how the K-Means algonthm groups data points. (05)

Q. 3. Answer the followings any one. (05)

A. Explain the concept of reinforcement learning and its main components with an example.

B. Describe how the K-Nearest Neighbors (KNN) algorithm works and mention one advantage and one limitation.

C. Explain the difference between Series and DataFrame in Pandas with example.

D. What is Regression? Explain in short.

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