JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

BBA-V Semester (BBA)

COURSE CODE(CREDITS): 25BBWHS532 (4) MAX. MARKS: 25

COURSE NAME: Data Analytics using Python

COURSE INSTRUCTORS: Dr. Nishant Jain MAX. TIME: 2 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	How does the choice of features and data preprocessing influence the performance of regression and classification models, and what best practices should be followed to ensure robust model development?	CO4	3
Q2	Explain how the simple moving average assists in preprocessing datasets such as stock market data?	CO2	3
Q3	In the context of exchange rate insurance, how does feature engineering contribute to improving the accuracy of machine learning models?	CO3	3
Q4	In practical applications, how can you determine whether a linear regression or a classification model is more appropriate for a specific predictive task?	CO2	3
Q5	How does the Mean Squared Error help in assessing the predictive accuracy of regression models, and what are the key considerations for interpreting this metric?	CO2	3
Q6	Using a numerical example and relevant mathematical explanations, illustrate how the following machine learning models operate: a. Linear regression. b. Artificial neural networks. c. K-means clustering.	CO2	3+3+3

<table>
<tr><td>Q7</td><td>Write a Python script to train a linear regression model on any provided dataset, including code to make predictions, visualize the regression line along with the dataset points, and display how the model fits the data.</td><td>CO1</td><td>4</td></tr>
<tr><td>Q8</td><td>Create a decision tree model that accurately represents the relationships on the dataset given below, where the input feature is X and the target variable is Y:
<table><tr><th>X</th><th>Y</th></tr><tr><td>1</td><td>2</td></tr><tr><td>2</td><td>3</td></tr><tr><td>3</td><td>2.5</td></tr><tr><td>4</td><td>5</td></tr><tr><td>5</td><td>4.5</td></tr></table>Illustrate the decision-making process by showing how the data is split at each node based on feature values. Additionally, explain the criteria used to select the splits and how the tree predicts Y for new X values.</td><td>CO2</td><td>4</td></tr>
<tr><td>Q9</td><td>Draw and explain a block diagram illustrating the steps involved in an expert decision system for a case study on exchange rate insurance?</td><td>CO3</td><td>3</td></tr>
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