KEONICS COMPUTER CENTER, HUBLI				
Artificial Intelligence with Python				
Total Marks:	**50**	**Test – 3**	**Date:**	**05-07-2023**

A. Answer the following for two marks. (Any 6) **Marks (2X6)=12**

1. Define the term "Central Tendency" in business statistics. Give one example of its application in the business context.
2. What is the purpose of calculating the "Standard Deviation" in business statistics?
3. Describe the concept of "Probability" in business statistics.
4. What is the significance of "Confidence Intervals" in business statistics?
5. What is a DataFrame in pandas? How is it different from a Series?
6. How can you access the shape of a given array?
7. How do you create a 1-dimensional NumPy array containing the integers from 1 to 10?

B. Answer the following (3 Marks each) (Answer any 6) **Marks (3X6)=18**

1. How can you merge two DataFrames in pandas based on a specific key column? Provide an example of performing an outer join on two DataFrames.
2. Utilizing Matplotlib, plot a bar chart to display the sales performance of three products for a given month. Customize the chart with appropriate labels, title, and colors.
3. Explain the concept of sampling distribution. Discuss its importance in making inferences about the population parameters.
4. Describe the process of reshaping a NumPy array using the "reshape" method. Provide an example of converting a 1-dimensional array to a 2-dimensional array.
5. How can you create a pie chart in Matplotlib to represent the percentage distribution of different product categories in a sales dataset? Customize the chart to display category labels and explode a specific segment.
6. Discuss the difference between discrete and continuous probability distributions and provide examples of each in a business context.
7. Implement a NumPy code to calculate the mean, median, and mode of a dataset.

Python Programming Practical

C. Answer Any 4 in following with python programs with outputs. (5 Marks each) **Marks (5X4)=20**

1. Given a dataset containing exam scores of students, write a program using NumPy to perform the following statistical analysis: a) Calculate the mean and median of the exam scores. b) Compute the standard deviation and variance of the scores.
2. Create a Python program using NumPy to generate a random array of size N, containing integers between a given range [low, high]. Calculate and display the mean, standard deviation, and sum of the array elements.
3. Given a dataset containing information about sales transactions, write a program using NumPy to do the following: a) Filter and extract sales data for a specific product category. b) Compute the total sales revenue for each region and display it in descending order.
4. Load a dataset with information about employees, including their department, salary, and age. Write a program using pandas to perform the following tasks: a) Group employees by department and calculate the average salary and median age in each department.
5. Calculate the bmi score of a person with height and weight and display health status accordingly.

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