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|  | | | | **Sri Eshwar College of Engineering**  (An Autonomous Institution)  Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai  Kondampatti (Post), Kinathukadavu (Tk), Coimbatore - 641 202 | | | |  | |
| **Continuous Internal Assessment – III :: Nov/Dec 2023** | | | | | | | | | |
| **Second Semester** | | | | | | | | | |
| **B.Tech. – Artificial Intelligence and Data Science**  **(Common to B.E. – MECH, B.Tech AIML)** | | | | | | | | | |
| **U23AD481– Python For AI** | | | | | | | | | |
| **(Regulations 2023)** | | | | | | | | | |
| **Duration: 2 Hours 15 mins** | | | | | | **Maximum Marks: 80** | | | |
| CO4 | | : To develop the skills necessary to tackle real-world AI challenges using Python as the primary toolset. | | | | | | | |
| CO5 | | : To proficiently analyze and extract insights from textual data through the application of NLP techniques  within Python. | | | | | | | |
| **Answer ALL Questions** | | | | | | | | | |
| **Part A – (12 X 2 = 24 Marks)** | | | | | | | | | |
| **Q. No.** | | | **Question** | | | | **M** | **CO#** | **KL** |
| 1 | | | Develope a Python program to generate a scatter plot using Matplotlib | | | | 2 | CO4 | K3 |
| 2 | | | Construct a python program to transform a 1D array into a 2D array with 2 rows using NumPy  **Sample Input:**  np.arange(10)  > array([ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9])  **Sample Output:**  array([[0, 1, 2, 3, 4],  [5, 6, 7, 8, 9]]) | | | | 2 | CO4 | K3 |
| 3 | | | Develop a python program to filter out only the even numbers and store them in the variable called filtered\_arr | | | | 2 | CO4 | K3 |
| 4 | | | Develop a pandas program to join the two given data frames along columns and assign all data. | | | | 2 | CO4 | K3 |
| 5 | | | Outline the importance of Tweepy cursors in effectively managing paginated data retrieved from the Twitter API, and illustrate their application | | | | 2 | CO4 | K2 |
| 6 | | | Develop a python program that utilizes the pandas library to display the top and bottom five elements of a list. | | | | 2 | CO4 | K3 |
| 7 | | | Extend purpose of NLTK in the context of natural language processing (NLP) tasks. | | | | 2 | CO5 | K3 |
| 8 | | | Outline the applications and uses of NLTK | | | | 2 | CO5 |  |
| 9 | | | Interpret Natural Language Processing (NLP) and elucidate its role in facilitating meaningful interactions between computers and human language | | | | 2 | CO5 | K2 |
| 10 | | | Compare Stemming and Lemmetization | | | | 2 | CO5 | K2 |
| 11 | | | Interpret the significance of removing stop words in text processing tasks and how it contributes to the effectiveness of NLP applications. | | | | 2 | CO5 | K3 |
| 12 | | | Construct a Python program to perform tokenization. | | | | 2 | CO5 | K3 |
| **Part B – (4 X 14 = 56 Marks)** | | | | | | | | | |
| 13 | a) | | (i) | | You are a data analyst working for a marketing agency tasked with analyzing the performance of a recent social media campaign across different platforms. Your goal is to visualize the engagement metrics (such as likes, shares, and comments) over time to analyze the trends and insights.   1. Identify the types of plots you would consider using in Matplotlib to represent time-series data, such as line plots, area plots, or scatter plots. Justify your choice based on the characteristics of the engagement metrics and the insights you aim to uncover. 2. Provide a code snippet demonstrating how you would use Matplotlib to create a time-series plot showcasing the trends in engagement metrics over the duration of the campaign. 3. Interpret the trends and patterns observed in the engagement metrics. Consider factors such as peak engagement periods, platform-specific performance, and the effectiveness of campaign strategies. | | 14 | CO4 | K3 |
|  |  | |  | | **(Or)** | |  |  |  |
| 13 | b) | |  | | Develop a Python program to create the above registration form using Tkinter | | 10 | CO4 | K3 |
|  | | | | | | | | | |
| 14 | a) | | (i) | | Develope a Python program using NumPy to sort the elements of the 2D array arr in ascending order and print the sorted array. | | 4 | CO4 | K3 |
|  |  | | (ii) | | Imagine you are analyzing the grades of students in a class. Assume you have a list grades containing integer values representing the grades (e.g., 0-100). Analyze the scenario and customize the histogram in python with appropriate bins, colors, and labels. Include axis labels and a title to provide context to the plot. | | 10 | CO4 | K4 |
|  |  | |  | | **(Or)** | |  |  |  |
| 14 | b) | | (i) | | Construct a Python script using NumPy to find the indices of all occurrences of the user input value in the array arr | | 4 | CO4 | K3 |
|  |  | | (ii) | | Analyze historical stock market data using Pandas to identify trends and patterns, and visualize the trends using Matplotlib. | | 10 | CO4 | K4 |
|  | | | | | | | | | |
| 15 | a) | | (i) | | Develop a Python script using NumPy to merge two 1-dimensional arrays, arr1 and arr2, into a single array | | 4 | CO5 | K3 |
|  |  | | (ii) | | Construct a python program to visualize word frequency in a given text dataset using Pandas library | | 10 | CO5 | K3 |
|  |  | |  | | **(Or)** | |  |  |  |
| 15 | b) | | (i) | | Develop a python program reverse the rows of a data frame? | | 5 | CO5 | K3 |
|  |  | | (ii) | | Imagine you're engaged in a media company project, where the goal is to scrutinize news articles using spaCy library Named Entity Recognition features. Analyze and develope a python program capable of detecting and classifying named entities like individuals, organizations, places, dates, and other pertinent entities within the text. | | 9 | CO5 | K3 |
|  | | | | | | | | | |
| 16 | a) | | (i) | | Discover the common pre-processing methods employed in mining Twitter data and explore how they enhance the quality of analysis and insights obtained from Twitter datasets. | | 7 | CO5 | k4 |
|  |  | | (ii) | | Develop a python program using Word Cloud library in Python to visualize word frequency in a given text. | | 7 | CO5 | K4 |
|  |  | |  | | **(Or)** | |  |  |  |
| 16 | b) | |  | | You’re assigned to analyzing online reviews for a popular restaurant utilizing Python’s TextBlob library. Having applied advanced text processing methods including tokenization, part-of-speech tagging, noun phrase extraction, and sentiment analysis, you’ve amassed significant insights. Analyze and develop a program tailored for comprehensive text analysis, integrating these techniques seamlessly to extract nuanced information from the restaurant reviews. | | 14 | CO5 | K4 |

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| **Faculty In-Charge** | **Verified by** | **Approved by** |
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| K1 – Remember | K2 – Understand | K3 – Apply | K4 – Analyze | K5 – Evaluate | K6 – Create |