

2056

B.E. (Computer Science and Engineering)
Fourth Semester

CSMS -301 : Python for Machine Learning and Data Science

Max. Marks: 50

Time allowed: 3 Hours

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Section.*

x-x-x		
I	a) What is exception handling? Name any two exceptions in Python. b) What is recursion? Give one example of a recursive function. c) What do you understand by outliers? Give two examples. d) What is Plotly? What is its utility? Discuss in brief. e) What is the utility of a Dash DataTable? Discuss in brief.	(02) (02) (02) (02) (02)
SECTION A		
II	a) What is a dictionary in Python? Write a program that takes a string as input and counts the frequency of each character using a dictionary and displays the result. b) What is a constructor in Python? What is its utility? Write a program that defines and uses a class BankAccount with attributes account number and balance and includes methods for deposit and withdrawal.	(05) (05)
III	a) What is the utility of modules in Python? Write a Python program that uses a user-defined module to check whether a number is prime. Appropriately assume any required information yourself. b) Explain the concept of NumPy arrays. How NumPy arrays differ from Python lists? Write a Python program to create a two-dimensional NumPy array and demonstrate indexing and slicing operations.	(05) (05)
IV	a) What is JSON? Why is it used? Write a Python program to store a list of dictionaries into a JSON file and then read the file to display the data in a structured format. b) Discuss the importance of linear algebra in scientific computing. Write a Python program to compute the determinant and find the inverse of a matrix.	(05) (05)
SECTION B		
V	a) Explain the concept of a Pandas DataFrame and its importance in data analysis. Write a Python program to create a DataFrame with missing values and demonstrate any two methods to handle missing data. b) Discuss the role of data visualization in data analysis. Write a Python program using any data visualization library to create a simple plot for a given dataset. Appropriately assume any required information yourself.	(05) (05)
VI	a) Differentiate between categorical and continuous values. Write a Python program to perform one-hot encoding on a categorical column. Appropriately assume any required information yourself. b) What are choropleth maps? Write a python program to demonstrate the utility of choropleth maps. Appropriately assume any required information yourself.	(05) (05)
VII	a) Explain the role of Tkinter in Python GUI development. Write a program to demonstrate the use of Entry and Button with the help of a suitable example. b) Discuss the concept of dashboards and their role in data analysis. Write a Python program to create a simple Dash application that displays a basic plot. Appropriately assume any required information yourself.	(05) (05)

x-x-x