Marks: 70   **Time** : 3 hrs.

SECTION A   **13 x 1 =13**

1.Which function is used to sort a dataframe?

2.What will be the output of following code:

import pandas as pd

import numpy as np

Arr1 = np.array([[1,2,3],[4,5,6]])

df = pd.DataFrame(Arr1, columns = ['num1','num2','num3'])

print (df.iloc[0,2])

3. In pandas, S in a series with following data :

S=pd.Series([5,10,15,20,25])

Find the output of :S[1:3]

4. State true/false

The applymap() applies the given function on each individual data element of the data frame.

5. Which method is used to change the name of the existing indexes/column-label in a dataframe?

6. Write syntax/example to create a histogram.

7. Consider following two arrays:

Ar1=np.array([[0,1,2],[3,4,5]])

Ar2= np.array([[10,11,12],[13,14,15]])

Write command to concatenate both arrays

 i) row wise   ii)column wise

8. What is the use of pipe() function in Python Pandas?

9. What is a DataFrame?

10. What will be the output of the following code:

   Import numpy as np

   Ar=np.arange(18).reshape(3,6)

11. Write the 2 different ways of giving import statement to import pyplot.

12. Which function is used to draw line chart and which method and value will you use to draw (………….)type of line .

13. In which of the following the matplotlib is preinstalled?

 (a)Anaconda   (b)Python 3.7 (c)Python 2.7

SECTION B   **15 X 2 =30**

1. What is pivoting? What is short coming of pivot()?

2. Write a code to create and display a 2D ndarray of shape (5,2). The element must lies between 10 and 30 and gap between the elements must be equal.

3. .Will the following code execute successfully? If not, give the reason?   2

```
importpandas as pd
df =pd.DataFrame({'A': ['John', 'John',
'Mina'],
    'B': ['Masters', 'Masters',
'Graduate'],
    'C': [27, 23, 21]})
df.pivot('A', 'B', 'C')
```

OR

3. What will be the Output ?

```
import pandas as pd
data = [1,2,3,4,5]
df = pd.DataFrame(data)
print (df)
```

4. What is a Quartile? How is it related to Quantile?

5. Consider the given table:

S.No.	Classes	Teacher	City
0	5	Rahul	Delhi
1	4	Deepti	Mumbai
2	6	Ansh	Chandigarh
3	2	Gyan	Delhi
4	3	Swati	Chandigarh

i) Write code to show above data in a DataFrame

ii)Write code to show sorted data according to City.

6. A=   6   5   4   B=   12   9   C=   1

     2   1   9   3   15   3

    10 6   3   6   0   2

D= 5   4   3

Write commands to accomplish the following:

i)Array A's product with 4 ii)Array B divide by 3

 iii)Array A's product with C iv)Array D's product with array A

7. Write the difference between array and List.

8. Explain the Data Frame function **transform**?

9. What is the difference between sort_index() and sort_values() methods in pandas library?

10. How to Check if a Data Frame has any missing values ?

2

11. What is pyplot? Is it a Python Library?

12. Why is the following code not producing any result? Why is it giving errors ?

(Note: All required libraries have been imported and are available.)

```
a= range(10,50,12)
b=range(90,200,20)
matplotlib.pyplot.plot(a,b)
```

13. Write a python code using pyplot to create a histogram for the following data set:

Marks=[38,10,15,25,28,35,47,49,50,63,67,53]

Give appropriate labels and titles

14. What is data visualization?

15. Define (i) Line chart (ii)Bar chart

SECTION C   **5 X 3 =15**

1. Explain following terms of NumPy arrays:

Rank   ii) Shape   iii) ItemSize

2. Given two ndarrays:

A=np.array([1,2,3,4,5])

B= np.array([3,4,0,-1,-3])

Write code to calculate:

Covariance   ii) correlation   iii) regression

3. A dictionary Grade contains the following:

Grade={'Name':['Rashmi','Harsh','Ganesh', 'Priya','Vivek'],
       'Grade':['A1','A2','B1','A1','B2']}

Write statements for the following:-

i)   Create a Dataframe named "Gr".

ii)   Add a column called 'marks' with following data:
     [97,92,95,89,96,82]

Delete 3rd and 5th rows,

4. Consider following ndarrayAry

     ([[1, 2, 3],

      [4, 5, 6,],

      [7, 8, 9]])

     What will be the output of following:

   (i) Ary[:1, :3]   (ii) Ary[: :-1, : :-1]   (iii) Ary[:3 , : : 2]

OR

4. Write Output of Following Code ?

```
import  numpy as np
a = np.array([1, 2, 3])
print(type(a))
```

3

```
print(a.shape)

print(a[0], a[1], a[2])

a[0] = 5

print(a)

b = np.array([[1,2,3],[4,5,6]])

print(b.shape)

print(b[0, 0], b[0, 1], b[1, 0])
```

5. From the following ordered set of data:

45, 49, 57, 67, 67, 68, 70, 70, 71, 73, 77, 79, 79, 80, 80, 81

i) Create a horizontal boxplot.ii) Show means in the boxplot

iii)Create boxplot without the box

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SECTION D   **3 x 4 =12**

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1. Write a program plot two data sets on the same bar graph.
First data set represents the marks of   Boys and second data
set represents marks of girls in a class

Boy_mark=[34,67,87,90,34]

Girl_mark=[45,80,23,56,99]

Proper labels, title and legends should be given to the plot.

2.consider the table company

Item	Company	Rupees	USD
TV	LG	12000	700
TV	VIDEOCON	10000	650
TV	LG	15000	800
AC	SONY	14000	750

Write code for (i) to(iii) and (iv) to find the output:

(i) To compute total rupees per item.

(ii) To compute number of company per item

(iii) To compute total USD per company

iv)
print(df.pivot_table(index='Item','Columns='Company',Values='Rupes')) **OR**

2. Create the following dataframe. Group the data on the basis of gender and find the name of the boy who got maximum marks

Rollno	Name	Gender	Marks
1	Nilansh	M	480
2	Mili	F	400
3	Josh	M	450
4	Kumar	M	240
5	Ishita	F	305
6	Mitali	F	398

3.   Write a menu based program to perform four basic mathematical operations on two 1D numpy arrays based on user's choice.