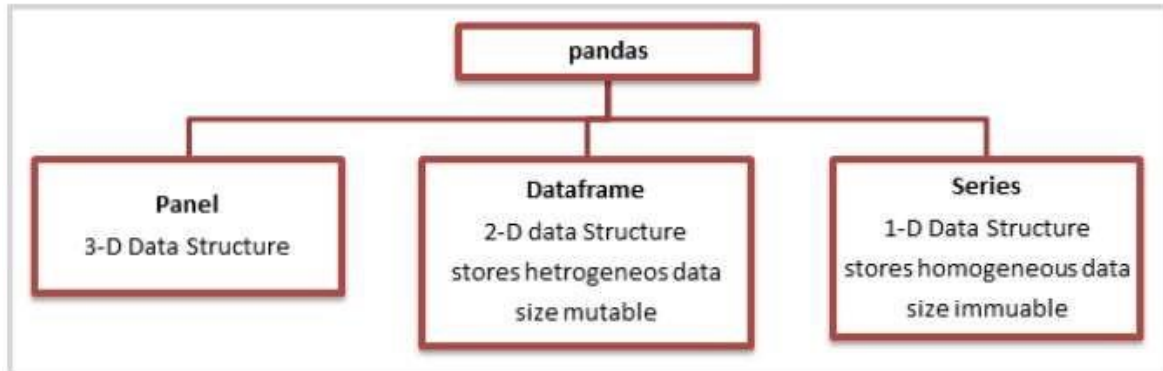


# Class 12<sup>th</sup> IP Notes

## Chapter 1



### Series:

- Series is an important data structure of pandas.
- It represents a **one-dimensional** array of indexed data.
- A series type object has two main components:
  - ✦ any array of actual data.
  - ✦ an associated array of indexes of data labels.
- A series type object can be created in many ways using pandas library's function **Series()**.
  - It is value mutable i.e., value stored in Series can be modified

### DataFrame :

- A DataFrame is another pandas data structure, which store data in two-dimensional way.
- It is actually a **two dimensional** (tabular and spreadsheet like) labeled array, which is an ordered collection of columns where columns may store different types of data, e.g., numeric or string or floating point or Boolean type etc.

### Major characteristics of a DataFrame data structure is as follows:

- It has two indices or two axes- a row index(axis=0) and a column index (axis=1).
- It is like a spreadsheet where each value is identifiable with the combination of **row index and column index**. The **row index is known as index** and the **column index is called column-name**.
- The indices can be of numbers or letters or strings.
- There is no condition of having all the data of same type across columns; its columns can have data of different types.
- You can easily change its value, i.e. it is value mutable.
- You can add or delete rows/columns in a DataFrame, i.e. it is size –mutable.

### Q. Explain Attributes of Pandas Series

#### ○ Attributes of Pandas Series

Attribute Name	Purpose	Example
name	Assigns or return a name to the Series	>>> seriesCap.name = 'Capitals' >>> print(seriesCap)

index.name	assigns a name to the index of the series	>>>seriesCap.index.name ='Countries' >>> print(seriesCap)
values	return a list of the values in the series	>>> print(seriesCap.values)
size	return the number elements	>>> print(seriesCap.size)
empty	return True if the series is empty, and False otherwise	>>>print(seriesCap.empty)
dtype	Return data type of series	>>>print(seriesCap.dtype)
shape	Return tuples (no.of rows) of the shape.	>>>print(seriesCap.shape)
nbytes	Return number of bytes	>>>print(seriesCap.nbytes)
ndim	Return number of dimension by definition it is 1	>>>print(seriesCap.ndim)
hasnans	Return True if there are any NaN value else False	>>>print(seriesCap.hasnans)

Method	Description	Example
head(n)	Returns the first n members of the series. Default value for <b>n</b> is 5. i.e. if n is not gives, it return first 5 rows from the Series.	>>>seriesTenTwenty.head(2)
count()	Returns the number of non-NaN values in the Series	>>>seriesTenTwenty.count()
tail(n)	Returns the last n members of the series. Default value for <b>n</b> is 5. i.e. if n is not gives, it return last 5 rows from the Series.	>>>seriesTenTwenty.tail(3)

## Question Answer on Series

### 1 Marks Questions

Q1. Which of the following command will show the last 3 rows from a Pandas Series named NP?

- a. NP.Tail( )
- b. NP.tail(3)
- c. NP.TAIL(3)
- d. All of the above

**Ans : b. NP.tail(3)**

Q2. To display last five rows of a series object 'S', you may write:

- a. S.head()
- b. S.Tail(5)
- c. S.head(5)
- d. S.tail()

**Ans: d. S.tail()**

Q3. **Assertion (A):-** To use the Pandas library in a Python program, one must import it.

**Reasoning (R):** - The only alias name that can be used with the Pandas library is pd.

- i. Both A and R are true and R is the correct explanation for A
- ii. Both A and R are true and R is not the correct explanation for A
- iii. A is True but R is False
- iv. A is false but R is True

**Ans: iii. A is True but R is False**

Q4. Which of the following statement will import pandas library?

- i. Import pandas as pd
- ii. import Pandas as py
- iii. import pandas as pd
- iv. import panda as pd

**Ans: iii. import pandas as**

**pd** Q5. Fill in the blanks:

```
import
pandas as pd
l1
=[11,12,13,14]
```

- (a) row
- (b) index
- (c) row\_index
- (d) All of the above

**Ans: (b) index**

Q6. While trying to create series from dictionary, keys of dictionary become index.

- (a) True
- (b) False
- (c) Depends on Python Version
- (d) None of the above

**Q7. Which index,data element will be printed by below code as output:-**

```
import pandas as pd
l1 =[11,12,13,14]
series1 =
pd.Series(l1)
```

- (a) Data : 12,13,14 along with series-index 1,2,3
  - (b) Data : 13,14 along with series-index 'C','D'
  - (c) Data : 13,14 along with series-index 2,3
  - (d) Data : 12,13,14 along with series-index 'B','C','D'
- Ans: (c) Data : 13,14 along with series-index 2,3**

Q8. To get the number of dimensions of Series object, \_\_\_\_\_ attribute is used.

- (a) size
- (b) shape
- (c) itemsize
- (d) ndim

**Ans:(d) ndim**

Q9. To skip not numeric or null values in series, we can use \_\_\_\_\_ attribute

- (a) skip
- (b) skipna
- (c) skipNaN
- (d) None of the above

**Ans:(b) skipna**

Q10: What will be correct syntax for pandas series?

(a) pandas\_Series( data, index, dtype) (b) panda.series( data, index, dtype)

(c) pandas.Series( data, index, dtype)

(d) panda\_Series( data, index, dtype)

Ans: (c) pandas.Series( data, index, dtype)

Q11. To get the number of dimensions of a Series object, \_\_\_\_\_ attribute is displayed.

(a) Index (b) Size (c) Itemsized (d) Ndim

Ans: (d) Ndim

Q12. To get the size of the datatype of the items in Series object, you can use \_\_\_\_\_ attribute.

(a) Index (b) Size (c) Itemsized (d)Ndim

Ans: (c) Itemsized

Q13. To get the number of elements in a Series object, \_\_\_\_\_ attribute may be used.

(a) Index (b) Size (c)Itemsized (d)Ndim

Ans: (b) Size

Q14. To get the number of bytes of the Series data, \_\_\_\_\_ attribute is displayed.

(a) hasnans (b) nbytes (c) ndim (d) dtype

Ans: (b) nbytes

Q15. To display third element of a Series object S, you will write\_\_\_\_\_.

```
import pandas as pd
```

```
list1=[10,20,30,40,50]
```

```
S = pd.Series(list1)
```

```
print(S[2])
```

(a) S[:3]

(b) S[2]

(c) S[3]

(d) S[:2]

Ans: (b) S[2]

### [2 Marks Questions]

Q1. Predict the output of the given Python code:

```
import pandas as  
pd list1=[-10,-  
20,-30] ser =
```

```
pd.Series(list1*2)
print(ser)
```

Ans: 0      -10  
1      -20  
2      -30  
3      -10  
4      -20  
5      -30

### (2 marks for correct output)

Q2. Complete the given Python code to get the required output as: **Rajasthan**

```
import _____ as pd
di = {'Corbett': 'Uttarakhand', 'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh',
      'Gir': 'Gujarat'}
NP = _____. Series( _____ )
print(NP[ _____ ])
```

Ans: **import pandas as pd** di = {'Corbett': 'Uttarakhand',  
'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh', 'Gir': 'Gujarat'}  
NP = pd.Series( di)  
print(NP[ 'Sariska'])

Q3. Write a program to create a series object using a dictionary that stores the number of students in each house of class 12D of your school.

**Note: Assume four house names are Beas, Chenab, Ravi and Satluj having 18, 2, 20, 18 students respectively and Pandas library has been imported as pd.**

Ans: **St={'Beas':18, 'Chenab':20, 'Ravi':20, 'Satluj':18} S1=pd.Series(St)**

Q4. What will be the output of the following code:

```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A>45)
```

Ans: **0      False**  
**1      False**  
**2      True**  
**3      False**

Q5. Which of the following code will generate the following output?

```
Jan    31
Feb    28
Mar    31
```

dtype: int64

- (a) `import pandas`  
`S1 = pd.Series(data = [31,28,31], index=["Jan","Feb","Mar"]) print(S1)`
- (b) `import pandas as pd`  
`S1 = pd.Series([31,28,31], index=["Jan","Feb","Mar"])`  
`print(S1)`
- (c) `import pandas as pd`  
`S1 = pd.Series([31,28,31], columns=["Jan","Feb","Mar"])`  
`print(S1)`
- (d) `import pandas as pd`  
`S1 = pd.Series([31,28,31], index=["Jan","Feb","Mar"])`  
`print(S1)`

**Ans.(d)** `import pandas as pd`

`S1 = pd.Series([31,28,31], index=["Jan","Feb","Mar"]) print(S1)`

## 1. What is Series? How many ways you can create a Series?

**Answer :** Series is a one-dimensional labeled array data structure that is capable of holding any data type. It is a key component of the popular data analysis library, **Pandas**. Series is essentially a column of data in a Pandas DataFrame, which is a two-dimensional labeled data structure.

One of the main benefits of Series is that it provides an easy way to label and index data, making it easier to perform operations on the data and access specific elements. This labeling and indexing also allows for quick and easy data aggregation and summarization.**Creating a Series in Python :1. Using a List:** You can create a Series from a Python list by passing the list to the Series constructor. The list can contain any data type, including integers, strings, and floating-point numbers. The index labels for the Series are automatically generated from 0 to the length of the list.

**2. Using a Dictionary:** A Series can also be created from a dictionary, where the keys of the dictionary are used as the index labels and the values of the dictionary are used as the values in the Series.

**3. Using ndarray:** You can create a Series from a NumPy ndarray by passing the ndarray to the Series constructor. This is a useful method if you have pre-existing arrays that you want to use in your analysis.

**4. Using Scalar Value:** You can also create a Series from a scalar value, which will create a Series with one element and the scalar value will be repeated as the value for all elements in the Series.

## 2. Write any 3 attributes of series with example.

**Answer :** The three attributes of series are :

1. Series.**dtype** : It returns the data type of the data.
2. Series.**size** : It returns the size of the data.
3. Series.**ndim** : It returns the number of dimensions in the data.

```
1 #Example of Series Attributes
2 import pandas as pd
3 seq=[50,70,90,80]
4 ser=pd.Series(seq)
5 print(ser)
6 print("Series Data Type : ",ser.dtype)
7 print("Number of elements in Series : ",ser.size)
8 print("Dimension of Series : ",ser.ndim)
```

#### **OUTPUT**

```
0    50
1    70
2    90
3    80
dtype: int64
Series Data Type :  int64
Number of elements in Series :  4
Dimension of Series :  1
```

# Chapter 2

## MCQ : Dataframes

- Which library in Python is used for working with DataFrames?  
a) NumPy      b) Pandas      c) Matplotlib      d) Scikit-learn
- Which of the following is a valid method to create a DataFrame in Pandas?  
a) From a CSV file      b) From dictionary of series  
b) c) From CSV File      d) All of the above
- How can you access the first five rows of a DataFrame?  
a) df.head(5)      b) df.tail(5)      c) df[0:5]      d) df.loc[0:4]
- Which method is used to check the dimensions of a DataFrame?  
a) df.info()      b) df.shape()      c) df.describe()      d) df.columns()
- Which method is used to check the summary statistics of a DataFrame?  
a) df.info()      b) df.shape()      c) df.describe()      d) df.columns()
- How can you select a specific column in a DataFrame?  
a) df['column\_name']      b) df.column\_name  
b) c) df.loc[:, 'column\_name']      d) All of the above
- How can you drop a column from a DataFrame?  
a) df.drop('column\_name', axis=1)      b) df.delete('column\_name', axis=1)  
b) df.remove('column\_name', axis=1)      d) df.drop\_column('column\_name')
- How can you filter rows in a DataFrame based on a condition?  
a) df[condition]      b) df.filter(condition)      c) df.loc[condition]      d) df.select(condition)
- How can you sort a DataFrame based on a specific column?  
a) df.sort\_by('column\_name')      b) df.sort\_values('column\_name')      c) df.sort('column\_name')      d) df.order\_by('column\_name')
- How can you rename a column in a DataFrame?  
a) df.rename\_column('old\_name', 'new\_name')      b) df.rename('old\_name', 'new\_name')  
b) df.rename(columns={'old\_name': 'new\_name'})      d) df.column\_name('old\_name', 'new\_name')
- Which method is used to fill missing values in a DataFrame?  
a) df.fill\_missing()      b) df.fillna()      c) df.fill\_null()      d) df.impute()
12. Pandas Dataframe is:  
a) 3 Dimensional      b) 1 Dimensional      c) 2 Dimensional      d) Multidimensional
14. The axis 0 identifies a dataframe's \_\_\_\_\_.  
a) rows      b) columns      c) values      d) datatype
15. What is the correct syntax to return the 5th row of a pandas DataFrame? Consider the name of the DataFrame is df:  
a) df[5]      b) df.loc[5]      c) df.loc[4]      d) df.iloc[5]
16. The function to\_csv used for converting a DataFrame to a CSV File is found in \_\_\_\_\_.  
a) Pandas Module      b) CSV Module      c) Python Module      d) None of these



17. When a DataFrame to a CSV File the attribute \_\_\_\_\_ is used to specify a separator other than comma(,)
- a) other                      b) sep    c) separator                      d) None of these
18. Which attribute of dataframe is used to perform the transpose operation on a dataframe?
- a) T                                      b) Ndim                                      c) Empty  
d) Shape
19. What is a correct syntax to return the values of 1st row of a Pandas DataFrame dfRent.?
- a) dfRent[0]                      b. dfRent.loc[1] c. dfRent.loc[0] d. dfRent.iloc
20. To display the 3rd ,4th and 5th columns from the 6th to 9th rows of a dataframe DF is....
- a) DF.loc [6:9,3:5]                      b) DF.loc [6:10,3:6] c) DF.iloc [6:10,3:6] d) DF.iloc [6:9,3:5]
21. If a dataframe is created using a 2D dictionary, then the column labels are formed from \_
- (a) dictionary's values (b) inner dictionary's keys (c) outer dictionary's key (d) none of these
22. Which among the following options can be used to create a DataFrame in Pandas?
- a) Scalar values (b) An ndarray (c) A python dict                      (d) All of these

### Competency based 2 Mark Questions: DataFrame

1. Consider the following DataFrame 'df' and answer following questions:

	rollno	name	UT1	UT2	UT3	UT4
0	1	Prerna Singh	24	24	20	22
1	2	Manish Arora	18	17	19	22
2	3	Tanish Goel	20	22	18	24
3	4	Falguni Jain	22	20	24	20
4	5	Kanika	15	20	18	22
5	6	BhatnagarRamandeep Kaur	20	15	22	24

- (a) The teacher needs to know the roll no, name and marks scored by the student with roll number 4. Help her to write the code.
- (b) Ms. Sharma, the class teacher wants to add a new column, the 'Grade' with the values, 'A', 'B', 'A', 'A', 'B', 'A', to the DataFrame. Help her to write code.

2. Consider the following DataFrame, named 'Stud'

	Name	Rollno	English	Hindi	Maths	Ssc	Science
0	Aman	101	65	54	87	69	74
1	Suman	102	69	64	90	87	59
2	Priya	103	75	72	98	90	75
3	Tahir	104	88	80	78	45	87

4	Bharti	105	45	53	81	69	98
---	--------	-----	----	----	----	----	----

Write commands to:

- i. Display the Name and Rollno.
- ii. Add a new row with values ( Rakesh ,106, 79 , 86, 91, 77, 93)

3. Consider the Dataframe DF as shown below.NOTE:Libraries has been imported.

	A	B	C
0	10	20	30
1	40	50	60

What will be the output of the following code?

- a) `print("I :",DF.iloc([0][0])`                      b) `print("II :",DF.loc([0][‘C’])`

4. Write the correct output on execution of the following Pandas code                      `import pandas as pd`

```
df = pd.DataFrame({'A':['p01', 'p02', 'p03'], 'B' : ['Pen', 'Pencil', 'Eraser']}) df =
df.rename(columns = {'A':"PID", "B':"PNAME"})                      df = df.rename(index = {0:"A", 1:"B",
2:"C"})

print(df)
```

5. Name the functions you can use to iterate over Dataframes.

6.Find the output of the following commands based on DataFrame TOY given below:

	TNAME	MATERIAL	PRICE	AGE
T1	TRAIN	STEEL	500	15
T2	DOLL	COTTON	100	6
T3	PUPPY	FUR	200	8
T4	SOLDIER	CLAY	50	12
T5	AEROPLANE	PLASTIC	150	10

- a) `TOY.loc[‘T2’;‘T4’],[‘MATERIAL’;‘AGE’]`                      b) `TOY.iloc[1:3,1:3]`

7. Answer the following questions based on DataFrame MRK given below:

	COMPANY	CITY
C1	MICROSOFT	SAN FRANCISCO
C2	MORGAN STANLEY	NEW YORK,
C3	COCA-COLA	ATLANTA

C4	INFOSYS	BANGALORE
----	---------	-----------

a) What is the output of MRK.T command?

b) What is the output of the following commands based on the DataFrame (MRK)

i) MRK.size

ii) MRK.shape

8. Write a python code to create a dataframe with headings (a and b) from the list given below:

[ [ 10,30],[15,20],[25,35]

9. Write a python code to create the following dataframe Books by any method of DataFrame creation and Give index as 'B1','B2','B3','B4'

BookName	Class	Price
Let us c	BCA	270
A. I.	B.Tech	350
DBMS	MCA	450
C. A.	BCA	250

### 3 Mark Questions: DataFrame

1. Consider a DataFrame (MRK) given below:

	NAME	PHY	CHEM
S1	ATUL	51	35
S2	ANIL	62	61
S3	ANUJ	45	46

(A) Write commands to create the DataFrame (MRK) using a Dictionary of Lists

(B) If a DataFrame is created using a 2D dictionary, then the column labels are formed from the inner dictionary's keys or outer dictionary's keys?

2. Assume the following Data Frame D1 and D2 given below:

	X	Z
P3	877	966
P4	544	366
P5	244	553

	X	Y	Z
P0	45	87	98

<b>P1</b>	<b>24</b>	<b>53</b>	<b>86</b>
<b>P2</b>	<b>85</b>	<b>92</b>	<b>47</b>

- Write a command append the second to the first
- Add a new Column between Y and Z in DataFrame D1 with any dummy values using insert command
- Rename the index of D2 : "P3" as PT2, "P4" as PT4 and "P5" as "PT5"

3. A dictionary 'Toys' contains the following:

Toys = {'Name':['Doll', 'Ludo', 'Chess', 'Blocks'], 'Price':[400,250,300,150]} Write statements for the following:

- Create a dataframe named "Stock" using dictionary 'Toys'.
- Add a column called 'Discount' with the following data. [30,40,15,25]

Delete column discount with all values

4. Write a python code for the following Dataframe Library using python pandas. Give index as 'B1', 'B2','B3','B4'

ItemNo	ItemName	Price
P99	SUGAR	100
P10	TEA	150
P50	COFFEE	200
P60	GREEN TEA	250

- Display Item Number and name whose price is less than 150.
- Display details of different types of Tea available in shop.
- Display the dataframe.

5. Consider the following DataFrame 'df' and answer questions from (i)-(iii):

ID	Name	Age	Fav_Colo	Points
T01	Rahul	32	Blue r	73
T02	Mohak	25	Green	82
T03	Rajeev	45	Orange	29
T04	Rohini	30	Pink	39

- I. Write down the command that will add a column "eligible" with default value as 'yes'.
- II. Write the command to extract the complete row 'T03'
- III. Which command will be used to drop a row from dataframe 'df' labeled as 'T04'?

4 Mark Questions:

### DataFrame

1. Write a Python code to create the following Dataframe Empdf from a Dictionary:

	EName	Salary
0	Kush	10000
1	Ruchika	12000
2	Divya	20000
3	John	25000

- a) Write python code to rename the index to 'A','B','C','D' in place of 0,1,2,3.
- b) Write python code to add a column 'Commission' with values as 5% of the Salary.

2. Assume a dataframe DF That contains data about climate condition of various cities with C1,C2,C3,C4,C5 as index and give the output for the questions given below.

	City	Maxtemp	Mintemp	Rainfall
C1	Delhi	40	32	24.1
C2	Bengaluru	31	25	36.2
C3	Chennai	35	27	40.8
C4	Mumbai	29	21	35.2
C5	Kolkata	39	23	41.8

- i) DF.shape
- ii) DF[1:2]
- iii) DF.loc['C1': 'C3', 'City']
- iv) DF.City

3. Using the below DataFrame mdf answer the questions a to d.

	C1	C2	C3
0	13	23	37
1	19	20	21
2	11	12	13
3	13	14	15

- a) Write code to create a new Dataframe n1 that stores the values of the Dataframe mdf multiplied by 3.

- b) Write code to drop the index 2 from the above Dataframe. The Dataframe should be modified after this statement.
- c) Write the code to display the sum of rows with indexes 2 onwards from the Dataframe mdf.
- d) Write code to add a column C4 in the dataframe which stores the differences of column C3 with column C2.

### 5 Mark Questions: DataFrame

1. Give the output of the command that follow based on the DataFrame DF below:

AUTHOR	PRICE	QTY
WILLIAM	1500	42
AGATHA	1300	85
LEO	600	48
ALEXANDER	1200	17
JIN	800	15
CAO	1700	20

- a) `>>> DF['PRICE']>=1000`    b) `>>> DF[DF['QTY']<=50]`    c) `>>> DF['QTY']%5`  
 d) `>>> DF.iloc[[2,3],[1,2]]`                      e) `>>> DF.QTY[2]=300`

2. Atul has stored some data in a DataFrame "MDF" as shown below. He wants to shift the data to CSV file. Write commands for questions that follow:

YEAR	SALES	LOSS
2001	85	42
2002	75	15
2003	64	62
2004	93	78
2005	67	52

- a) What is the full form of CSV
- b) A CSV file can take ; character as separator  
 A) True                                      B) False
- c) To convert the above DataFrame "MDF" to a CSV file "TEXT.CSV"
- d) To read and display the CSV file "TEXT.CSV" thus formed without header
- e) To delete the column LOSS

3. Write code for the following questions on the basis of following DataFrame 'Sales'.

INDEX		2014	2015	2016	2017
	Madhu	100.5	12000	20000	50000
	Kusum	150.8	18000	50000	60000
	Kinshu	200.9	22000	70000	70000
	Ankit	30000	30000	100000	80000
	Shruti	40000	45000	125000	90000

- Display the transpose of DataFrame Sales.
- Display the sales made by Madhu and Ankit in the year 2016 and 2017.
- Delete the data for sales man Kinshuk from the DataFrame Sales.
- Update the sale made by Shruti in 2017 to 100000.
- Rename the index as 'A','B','C','D','E'

### Answer key

Dataframe MCQ

- b) Pandas
  - d) All of the above
  - a) df.head(5)
  - b) df.shape()
  - c) df.describe()
  - d) All of the above
  - a) df.drop('column\_name', axis=1)
  - a) df[condition]
  - b) df.sort\_values('column\_name')
  - c) df.rename(columns={'old\_name': 'new\_name'})
  - b) df.fillna()
- 12.c    13.a    14.c    15.b    16.b    17.a    18.a    19.c    20.b    21.d

Competency based

Answers of 2 Mark Questions of Dataframe

- a) df.loc[3]
- i) Stud[['Name','Rollno']]

b)df['Grade']=['A','B','A','A','B','A']

ii)Stud.loc[5]= ['Rakesh',106,79,86,91,77,93]

3. a)I:10 b) II:30

4. PID PNAME

5. Iterrows( ) , iteritems ( )

A P01 Pen

B P02 Pencil

C P03 Eraser

6. a) MATERIAL AGE

b) MATERIAL PRICE

T2 COTTON 6 T2 COTTON 100

T4 CLAY 12 T3 FUR 200

7. a)

MRK.T

	C1	C2	C3	C4
COMPANY	MICROSOFT	MORGAN STANLEY	COCA-COLA	INFOSYS
CITY	SAN FRANCISCO	NEW YORK	ATLANTA	BANGALORE

b) i) MRK.size 8

ii) MRK.shape (4, 2)

8. import pandas as p

9. B={'Book\_Name':['Let us C','A.I.','DBMS' , 'C.A.']}

import numpy as np

'Class' : ['BCA', 'B. Tech', 'MCA', 'BCA']

A=np.array([[10,20],[30,40],[50,60]]) 'Price' : [ 270,350,450,250] }

df=p.DataFrame(A,columns=['a','b']) Books= pd.DataFrame(B)

print(df)

print(Books)

### Answers of 3 Mark Questions:DataFrame

1.a)

```
MRK=pd.DataFrame({'NAME':['ATUL','ANIL','ANUJ'],'PHY':[51,62,45],'CHEM':[35,61,46]},  
index=['S1','S2','S3'])
```

b) outer dictionary's keys

2. a) D1.append(D2) b) D1.insert(2,'A',[100,200,300])

X Y Z

P0 45 87.0 98

P1 24 53.0 86

P2 85 92.0 47



P3 877 NaN 966

P4 544 NaN 366

P5 244 NaN 553

c) D2.rename({'P3':'PT2','P4':'PT4','P5':'PT5'},axis='index')

3. .i) stock = pd.DataFrame(Toys)

4.i) print(Library["Price"]<150))

ii) stock [ "discount" ] = [30,40,15,25]

ii) print( Library.Itemname)

iii) stock.drop("discount",axis=1)

iii) print(Library)

5. I. df['eligible'] = 'yes' II)Ans: df[df.ID == 'T03'] III. df.drop(3, axis = 0, inplace = True)

#### 4 Mark Questions: DataFrame

1.D = {'ENAME': ['Kush','Ruchika','Divya','John'],'Salary': [10000,12000,20000,25000]}

Empdf = pd.DataFrame(D)

a) Empdf.rename(index = {0:'A',1:'B',2:'C',3:'D'}, inplace = True)

b) Empdf['Commission'] = Empdf['Salary']\*.05

2. i) (5,4)

ii) C2 Bengaluru

31

25

36.2 iii) C1

Delhi

C2 Bengaluru

C3 Chennai

iv) 0 Delhi

1 Bengaluru

2 Chennai

3 Mumbai

4 Kolkata

3. a) n1 = mdf \* 3

b) mdf = mdf.drop(2)

c)mdf.iloc[2:].sum()

d) mdf['C4'] = mdf['C3'] – mdf['C2']

#### Answer of 5 Mark Questions

1. a) C1 True

C2 True

C3 False

C4 True

C5

False C6

True b)

	AUTHOR	PRICE	QTY	C1
WILLIAM	1500	42		
C3	LEO	600	48	
C4	ALEXANDER	1200	17	
C5	JIN	800	15	
C6	CAO	1700	20	

c) C1 2  
 C3 3  
 C4 2  
 C5  
 0 C6  
 0 e)

d) PRICE QTY C2 0  
 C3 600 48  
 C4 1200 17

AUTHOR	PRICE	QTY
LEO TOLSTOY	600	300

2. a) Comma Separated Values                      b) True                      c) `MDF.to_csv("TEXT.CSV")`

d) `import pandas as pd`                      e) `del MDF['LOSS']`

`pd.read_csv("TEXT.CSV",header=None)`

3. a) `Sales.T`                      b) `Sales.loc[['Madhu','Ankit'],[2016,2017]]`

c) `Sales.drop(['Kinshuk'], axis = 0, inplace = True)`

d) `Sales.loc['Shruti',2017] = 100000`

e) `Sales.rename(index={'MADHU':'A','KUSUM':'B','Kinshu':'C','ANKIT':'D', 'SHRUTI':'E'})`