

XII – IP – TERM 1 (QP) (70 MARKS)

General Instructions:

1. This question paper contains two parts A and B. Each part is compulsory.
2. Both Part A and Part B have choices.
3. Part-A has 2 sections:
 - a. Section – I (1 mark questions) is short answer questions, to be answered in one word or one line.
 - b. Section – II (4 mark questions) has two case studies questions. Each case study has 4 case-based sub-parts. An examinee is to attempt any 4 out of the 5 subparts.
4. Part - B is Descriptive Paper. It has three sections
 - a. Section-I is short answer questions of 2 marks each in which two questions have internal options.
 - b. Section-II is long answer questions of 3 marks each in which two questions have internal options.
 - c. Section-III is very long answer questions of 5 marks each in which one question has internal option.

PART - A

SECTION-1

Attempt any 15 questions from question 1 to 21. Each carries one mark.

1. Fill in the blank:

The command used to give a heading to a graph is _____

- (a) pl.plot() (b) pl.xlabel() (c) pl.marker() (d) pl.title()

2. CSV stands for

- (a) Common Separation Value (b) Comma Separated Values
(c) Common Separation Values (d) Comma Separated Value

3. Read the statements given below and identify the right option to draw a histogram.

Statement A: To make a Line Chart with Matplotlib, we can use the plt.lineplot() function.

Statement B: We can use plt.print() function to display a line chart.

Assume we have imported matplotlib as plt

- (a) Statement A is correct (b) Statement B is correct
(c) Both statements A and B are incorrect
(d) Both Statements A and B are correct

4. Which is incorrect statement for the python package Numpy?

- (a) It is a general purpose array processing package.
(b) Numpy arrays are faster and more compact
(c) It is multi-dimensional arrays
(d) It is proprietary software

5. Consider the following Series in Python:

data=pd.Series([10,15,20,25,30,35],index=['a','b','c','d','e','f'])

Which statement will display multiples of 3?

- (a) print(data%3==0) (b) print(data(data%3!=0))
(c) print(data mod 3!=0) (d) print(data[data%3=0])

6. Which of the following would give the same output as DF1-DF2 where DF1 and DF2 are DataFrames.

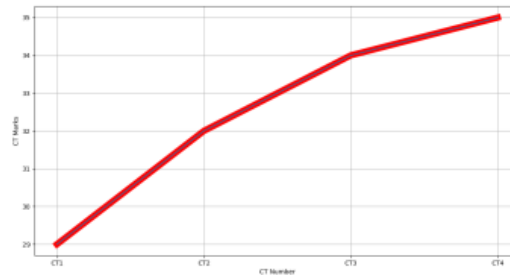
- (a) DF1.sub(DF2) (b) sub(DF1,DF2) (c) DF2.rsub(DF1) (d) Both a and c

7. In a DataFrame, Axis= 1 represents the _____ elements.

8. What is not true about Data Visualization?

- (a) Graphical representation of information and data.
(b) Helps users in analyzing a large amount of data in a simpler way.
(c) Data Visualization makes complex data more accessible, understandable, and usable.
(d) No library needs to be imported to create charts in Python language.

9. Which python library is not used for data science?
 (a) Panda (b) Numpy (c)Matplotlib (d)Tkinter
10. Using Python matplotlib _____ can be used to count how many values fall into each interval
 (a) Line plot (b) Bar graph (c) Histogram
11. Read the statements given below.
 Identify the right option from the following for Attribute and method/function.
Statement A: Function/Method cannot work without arguments.
Statement B: Attribute always ends without parenthesis.
 (a) Both statements are correct.
 (b) Both statements are incorrect.
 (c) Statement A is correct, but Statement B is incorrect
 (d) Statement A is incorrect, but Statement B is correct
12. Pandas data frame cannot be created using:
 (a) Dictionary of tuples (b) Series (c) Dictionary of List (d) List of Dictionaries
13. Which library is imported to draw charts in Python?
 (a) csv (b) matplotlib (c)numpy (d) pandas
14. _____ is the function to save the graph.
 (a) Savefig() (b) Savefigure() (c) Savegraph() (d) Savechart()
15. Identify the linestyle of the following line chart.



- (a) dashed (b) solid (c) dash dot (d) dotted
16. Consider the CSV File : “Marks.csv” in the address (location) D:\XII

	A	B	C
1	1	Tagore	75
2	2	Rani	82
3	3	Mohan	78
4	4	Suresh	89
5	5	Prasanna	95

Write a statement to read first 3 rows of the above CSV file to a DataFrame Object df.

17. Consider the following code snippet and fill the given blank
 (Write code to copy dataframe into a CSV file “toppers.csv” in address (location) D:\School
 dict= {'RNo':[15,7,5,12], 'Name':['Srinidhi','Ratan','Maheswari','Suresh'], 'Marks':[98.5,99.2,97.3,99.5]}
 DF=pd.DataFrame(dict, index=['Sec A','SecB','SecC','Sec D'])
 DF._____ (“_____”)
18. While accessing the column from the data frame, we can specify the column name.
 In case column does not exist, which type of error it will raise:
 (a) Key Error (b) Syntax Error (c) Name Error (d) Runtime Error
19. Consider the following code:
- ```
import numpy as np
import pandas as pd
L=np.array([2,4])
x=pd.Series(_____) # statement 1
```

```
print(x)
```

output of the above code is :

```
0 16
```

```
1 256
```

```
dtype:int64
```

What is the correct statement for the above output in the following statement 1?

- (a) `d=L*3`      (b) `L*4`      (c) `L**4`      (d) `[2,4]**3`

20. Which function will be used to read data from a CSV file into pandas data frame?

- (a) `readcsv()`      (b) `to_csv()`      (c) `read_csv()`      (d) `csv_read()`

21. Difference between `loc()` and `iloc()` .:

- (a) Both are Label indexed based functions.  
(b) Both are Integer position-based functions.  
(c) `loc()` is label based function and `iloc()` integer position based function.  
(d) `loc()` is integer position based function and `iloc()` index position based function

### SECTION-II

**Both the case study based questions (22 & 23) are compulsory.**

**Attempt any four sub parts from each question. Each sub question carries 1 mark.**

22. **Rahul has learning DataFrame Attributes concept. He has created the following DataFrame df. Help him by suggest him the correct answers.**

```
 Month Sales
0 Jan 150
1 Feb 220
2 Mar 275
3 Apr 260
```

(i) Select an option to get the following output: `Index(['Month', 'Sales'], dtype='object')`  
(a) `df.index`      (b) `df.columns`      (c) `df.shape`      (d) `df.T`

(ii) Select an option to get the following output:

```
 0 1 2 3
Month Jan Feb Mar Apr
Sales 150 220 275 260
```

- (a) `df.values`      (b) `df.columns`      (c) `df.shape`      (d) `df.T`

(iii) Select an option to get the following output:

```
Month object
Sales int64
dtype: object
```

- (a) `df.dtypes`      (b) `df.columns`      (c) `df.shape`      (d) `df.values`

(iv) Select an option to get the following output:

```
[RangeIndex(start=0, stop=4, step=1), Index(['Month', 'Sales'], dtype='object')]
```

- (a) `df.dtypes`      (b) `df.values`      (c) `df.axes`      (d) `df.ndim`

(v) Select an option to get the following output:

```
[['Jan' 150]
 ['Feb' 220]
 ['Mar' 275]
 ['Apr' 260]]
```

- (a) `df.dtypes`      (b) `df.values`      (c) `df.axes`      (d) `df.ndim`

23. **Meena is learning about data visualization concept in python. Help her by clarifying her doubts.**

- (i) Identify the correct import statement from the following:  
 (a) import matplotlib.pyplot as plt                      (b) import matplotlib as plt  
 (c) import pyplot as plt                                      (d) import matplotlib.pyplot as plt
- (ii) Where can we arrange legend position  
 (a) upper right                      (b) Lower middle                      (c) lower left                      (d) a and c
- (iii) A \_\_\_\_\_ is a type of chart which displays information as a series of data points called 'markers'  
 (a) Bar chart                      (b) Line Chart                      (c) Histogram                      (d) Pie Chart
- (iv) Name the function to create a line chart from the following:  
 (a) bar( )                      (b) hist( )                      (c) plot( )                      (d) scatter( )
- (v) A \_\_\_\_\_ is a color or mark linked to a specific data range plotted.  
 (a) color                      (b) legend                      (c) edge color                      (d) color mark

**PART – B**  
**SECTION – 1**

24. Write a program to read a CSV file "rates.csv" stored in address (location) C:\Expenditure. (Store the contents of that CSV file in a dataframe and display it)
25. (i) Sudhanshu has written the following code to create a DataFrame with Boolean index:

```
import numpy as np
import pandas as pd
df=pd.DataFrame(data=[[2,3,4,5]],index=[true,true,false,true])
print(df)
```

**While executing the code, she is getting an error, help her to rectify the code:**

- (a) df=pd.DataFrame([True,True,False,True],data=[2,3,4,5])  
 (b) df=pd.DataFrame(data=[2,3,4,5],index=[True,True,False,True])  
 (c) df=pd.DataFrame([true,true,false,true],data=[2,3,4,5])  
 (d) df=pd.DataFrame(index=[true,true,false,true],data=[[2,3,4,5]])

- (ii) Mr.Raman created a DataFrame from a Numpy array:

```
arr=np.array([[2,4,8],[3,9,27],[4,16,64]])
df=pd.DataFrame(arr,index=['first','second','third'],_____)
print(df)
```

**Help him to add a customized column labels to the above DataFrame**

- (a) columns='start','middle','end'                      b) column=['start','middle','end']  
 (c) columns=['start','middle','end']                      d) columns=[['start','middle','end']]

**(OR)**

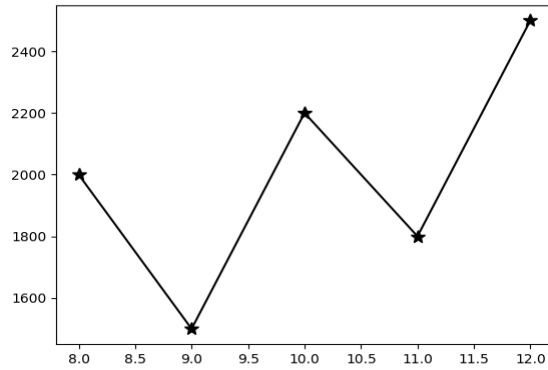
**Consider the following Series Object : "Vegetables" and write outputs for questions (i) & (ii)**

```
45 Brinjal
35 Ladies Finger
20 Onion
50 Tomato
40 Chilli
```

- (i) print(Vegetables.tail())                      (ii) print(Vegetables.head(3))

26. Answer the following questions (i) & (ii)

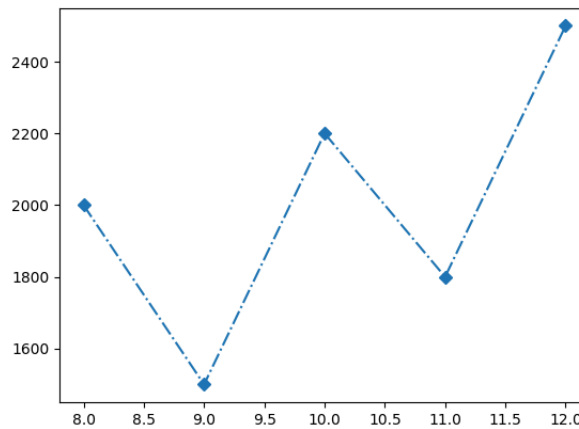
- (i) Consider the following line chart.



Which statement is used to mark the line as given in the above fig.:

- (a) `plt.plot(x,y,marker='#',markersize=10,color='b',linestyle='dashdot')`
- (b) `plt.plot(x,y,marker='*',markersize=10,color='k')`
- (c) `plt.plot(x,y,marker='star',markersize=10')`
- (d) `plt.plot(x,y,marker='@',markersize=10,color='m',linestyle='dashdot')`

(ii) Consider the following Line Chart:



Which statement is used to mark the line as given in the above figure?

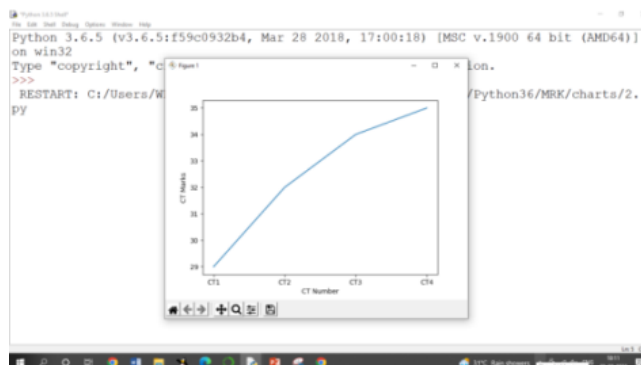
- (a) `plt.plot(a,b,marker='D',ls='dashdot')`
- (b) `plt.plot(a,b,marker='Diamond',ls='solid')`
- (c) `plt.plot(a,b,marker='s',ls='dotted')`
- (d) `plt.plot(a,b,marker='r',ls='dashed')`

27. The following are the ages of persons in an organisation.

8,9,10,11,12,15,25,22,7,5,45,48,56,25,48,59,36

Write a program to display the above data in the form of a histogram.

28. When Mohan is working with charts, he is viewing the charts in a default size like following size:



He decided to change the width and length of the plot. Also he want to see grid lines.

Assume matplotlib.pyplot is imported as plt

(i) Write a statement to change the width of the figure size=15, length=7.

(ii) Write a statement to display grid lines.

29. Consider the DataFrame “df” and write output for (i) and (ii)

|   | Fruit Name | Price |
|---|------------|-------|
| 0 | Banana     | 3     |
| 1 | Apple      | 20    |
| 2 | Popaya     | 35    |

(i) print(df.count(1))    (ii) print(df.shape[0])

(OR)

Consider the DataFrame “df” and write statement for (i) and (ii)

|   | Fruit Name | Price |
|---|------------|-------|
| 0 | Banana     | 3     |
| 1 | Apple      | 20    |
| 2 | Popaya     | 35    |

(i) Write a statement to rename index “0” to “zero”.

(ii) Write a statement rename column “Price” to “cost”.

30. Consider the following 2 Series Objects S1,S2 and write output of (i) & (ii)

|   | S1 | S2   |
|---|----|------|
| 0 | 10 | 5.5  |
| 1 | 15 | 7.0  |
| 2 | 21 | 12.0 |
| 3 | 25 |      |

(i) print(S1\*S2)    (ii) print(S2-S1)

31. Differentiate between Series and DataFrames.

32. Consider the following Series “S”

|        | Value |
|--------|-------|
| First  | 75    |
| Second | 88    |
| Third  | 95    |

(i) Write a statement to change the value “75” to “85”.

(ii) Write a statement to change the index from  
“First”, “Second”, “Third” to “One”, “Two”, “Three”.

33. Consider the following Series Object “Value”. Write the output for (i) and (ii)

|   | Value |
|---|-------|
| 0 | 10    |
| 1 | -5    |
| 2 | 12    |
| 3 | 7     |

(i) Write a statement to arrange the Series in descending order (it should change the data permanently in the Series).

(ii) Write the output after sorting is completed.

## SECTION – II

34. Consider the hist( ) function and answer the following questions (i) to (ii) basing on hist( ) functions syntax (for example, in line chart, “linestyle” property have the following 4 values: dashed, solid, dash dot, dotted)

(i) Write 2 property values for “Orientation”

(ii) Write 4 property values for “histtype”

(iii) Read the two statements carefully and the correct answer.

**Statement A :** Histograms works on continuous data

**Statement B :** Histograms and Bar Charts are Same.

(a) Both statements are correct.

- (b) Both statements are incorrect.
- (c) Statement A is correct, but Statement B is incorrect
- (d) Statement A is incorrect, but Statement B is correct

**35. Consider the following Series Object “Fruits” and answer the questions (i) to (iii)**

|        |    |
|--------|----|
| Apple  | 25 |
| Mango  | 20 |
| Popaya | 35 |
| Lemon  | 2  |

- (i) Write a statement to display first 3 data items.
- (ii) Write the output of the statement: `print(Fruits[Fruits>20])`
- (iii) Write the output of the statement: `print(Fruits>20)`

**(OR)**

Assuming the given series, named “mymarks” shown below, and answer the questions (i) to (iii)  
(Write the outputs)

|       |    |
|-------|----|
| CT1   | 32 |
| CT2   | 29 |
| CT3   | 31 |
| CT4   | 33 |
| Term1 | 58 |
| Term2 | 65 |

- (i) `print(S[2: ])`
- (ii) `print(S[:-1])`
- (iii) `print(S[1:5:2])`

**36. Consider the following DataFrames DF1, DF2, DF3 and answer the following questions**

**(Write outputs)**

|   | A | B | C |
|---|---|---|---|
| 0 | 1 | 2 | 3 |
| 1 | 4 | 5 | 6 |
| 2 | 7 | 8 | 9 |

**DF1**

|   | A   | B   | C   |
|---|-----|-----|-----|
| 0 | 100 | 200 | 300 |
| 1 | 400 | 500 | 600 |

**DF2**

|   | A     | B     |
|---|-------|-------|
| 0 | 50.5  | 250.0 |
| 1 | 150.5 | 350.5 |

**DF3**

- (i) `print(DF1.add(DF2))`
- (ii) `print(DF1.rsub(DF2))`
- (iii) `print(DF3*DF1)`

**(OR)**

**Consider the following dataframe df.**

|        | Stu | Present |
|--------|-----|---------|
| First  | 10  | 22      |
| Second | 15  | 25      |

**Write a program to create & display the output of the above dataframe df, row by row using `iterrows()` function. (No need to write output)**

**Desired Output:**

Row index: First

Stu 10

Present 22

Name: First, dtype: int64

Row index: Second

Stu 15

Present 25

Name: Second, dtype: int64

**37. Consider a given Series, Tablets:**

|       |         |            |
|-------|---------|------------|
| index | Tablets |            |
|       | BP      | Taxim      |
|       | Sugar   | Glycomet   |
|       | Fever   | Paracetmol |
|       | Cold    | Vicks      |

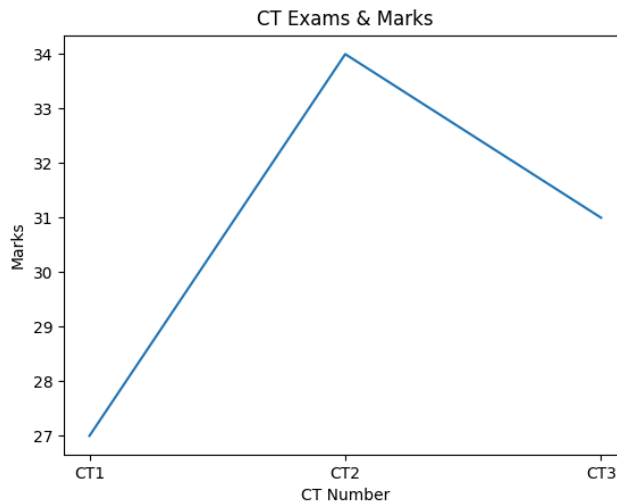
Write a program in Pandas to create the Series. Also write the output.

### SECTION – III

38. Consider the following Series Object “S” and write the **outputs** for the following:

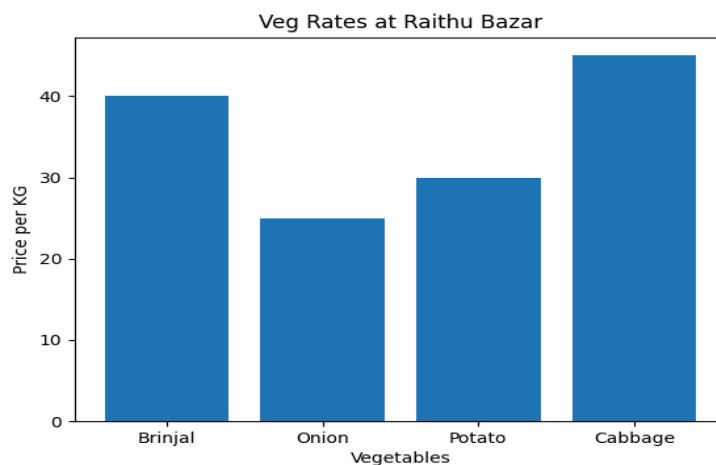
|                        |              |    |
|------------------------|--------------|----|
| (i) print(S.index)     | Eng          | 92 |
| (ii) print(S.shape)    | Mat          | 85 |
| (iii) print(S.hasnans) | Phy          | 79 |
| (iv) print(S.nbytes)   | Che          | 95 |
| (v) print(S.dtype)     | Bio          | 45 |
|                        | IP           | 77 |
|                        | dtype: int64 |    |

39. Consider the following graph. Write the code to plot it.



(OR)

Consider the following graph. Write the code to plot it.



40. Consider the following DataFrame Object and answer the questions (i) to (iv)



|       | Rollno | Name     | Marks |
|-------|--------|----------|-------|
| One   | 1      | Kamal    | 92    |
| Two   | 2      | Praneeth | 87    |
| Three | 3      | Naveen   | 82    |
| Four  | 4      | Mukesh   | 75    |

- (i) Write the program to create and display the above DataFrame df. (2m)
- (ii) Add a new column "Hobbies" with values "Swimming", "Dance", "Music", "Dance" to the DataFrame df (1m)
- (iii) Add a new row with the following values (5, "lokesh", 85) with index "Five" (1m)  
(Consider the original data only)
- (iv) Write a statement to change the data in DataFrame from "Praneeth" to "Kiran". (1m)