

XII – IP – PT 6 (KEY) (35 MARKS)

General instructions:

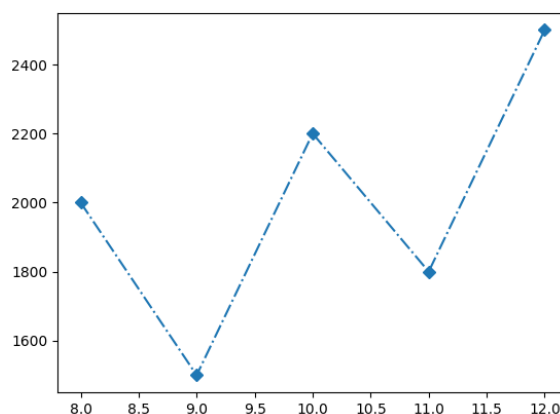
The question paper is divided into 5 sections – A, B,C,D andE

- Section A, consists of 9 questions (1-9). Each question carries 1 mark.
- Section B, consists of 4 questions (10-13). Each question carries 2 marks.
- Section C, consists of 3 questions (14-16). Each question carries 3 marks.
- Section D, consists of 1 question (17). It carries 4 marks.
- Section E, consists of 1 question (18). It carries 5 marks.
- Internal choices have been given for question numbers – 11,15 and 17

SECTION – A

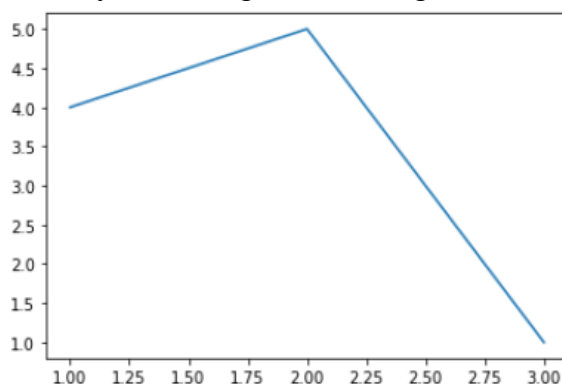
Each question carries 1 mark

1. Which of the following is correct statement to import pyplot module?
a) **import matplotlib.pyplot** b) import MatPlotLib.PyPlot
c) import matplotlib.plot as plt d) import pyplot.plot
2. To change the width of bars in bar chart, which of the following argument with a float value is used?
a) thick b) thickness c) **width** d) barwidth
3. The command used to give a heading to a graph is _____
a) plt.show() b) plt.plot() c) plt.xlabel() d) **plt.title()**
4. Identify the line style in the below picture



- a) dashed b) solid c) **dash dot** d) dotted

5. Observe the following figure. Identify the coding for obtaining this as output.



- a. import matplotlib.pyplot as plt
plt.plot([1,2],[4,5])
plt.show()

b. `import matplotlib.pyplot as plt`
`plt.plot([1,2,3],[4,5,1])`
`plt.show()`

c. `import matplotlib.pyplot as plt`
`plt.plot([2,3],[5,1])`
`plt.show()`

d. `import matplotlib.pyplot as plt`
`plt.plot([1,3],[4,1])`
`plt.show()`

6. What is plt in the given statement?

`import matplotlib.pyplot as plt`

a) an alias

b) an alternative name for matplotlib.pyplot

c) argument of import statement

d) Both (a) and (b)

7. There are 7 rows in a dataframe “DF”. How many rows will be displayed by the following statement?

`DF.head(10)`

a) 10 rows

b) 7 rows

c) Error message will be displayed

d) No output will be displayed

8. When we try to add a row with lesser values than the number of columns in the DataFrame, it results in a _____ error

a) value

b) key

c) index

d) No error

9. **Q9 is ASSERTION AND REASONING based question.** Mark the correct choice as

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

Assertion (A) : Histogram is used to summarize discrete or continuous data that are measured on an interval scale

Reason (R): We can use `plt.print( )` function to display Histogram

Answer) iii

SECTION – B

Each question carries 2 marks

10. Write a program to Create a Dataframe “Emp” as per the following and store the data frame as “Novsalary.csv” file in E Drive, SDetails folder.

	ENo	Name	Salary
Employee 1	1	Karun	25000.0
Employee 2	2	Nagur	NaN
Employee 3	3	Sulochana	37000.0
Employee 4	4	NaN	41000.0

Answer)

`import pandas as pd`

`import numpy as np`

`dict={'ENo':[1,2,3,4],'Name':['Karun','Nagur','Sulochana',np.NaN],'Salary':[25000,np.NaN,37000,41000]}`

`DF=pd.DataFrame(dict,index=['Employee 1','Employee 2','Employee 3','Employee 4'])`

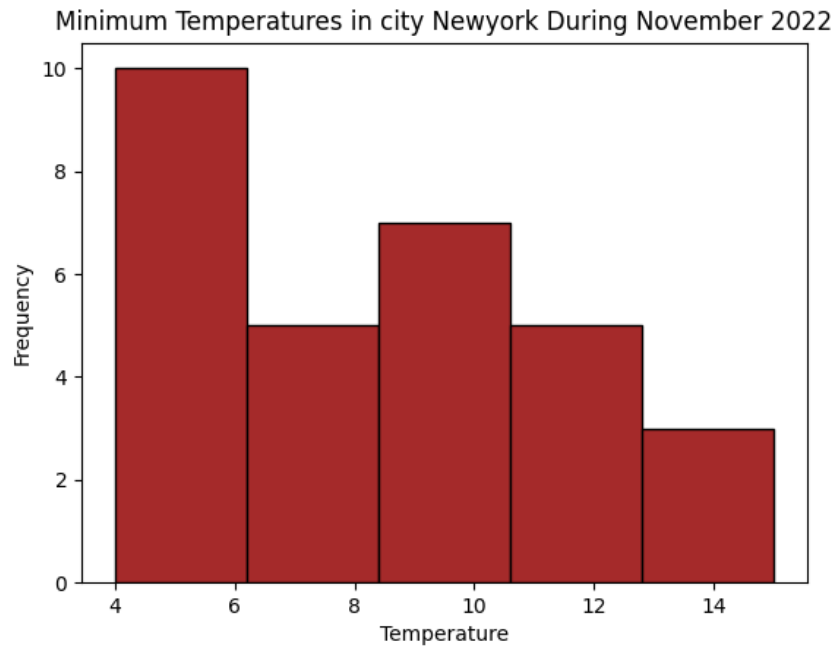
`DF.to_csv("E:\\SDetails\\Novsalary.csv")`

11. Write a program to import first 3 records of above CSV file (from the above said file location) into the Dataframe “MyDF”.

Answer) `import pandas as pd`

`DF.read_csv("E:\\SDetails\\Novsalary.csv",nrows=3)`

12. Write program to display following Histogram based on the Minimum Temperatures in the city “Newyork” during November 2022.



Minimum_Temperatures =[6,5,6,5,5,5,4,9,11,12,14,15,12,13,11,11,8,7,10,10,9,9,7,8,9,5,6,6,7,10]

Give titles for x-axis, y-axis and whole chart as shown in the above picture.

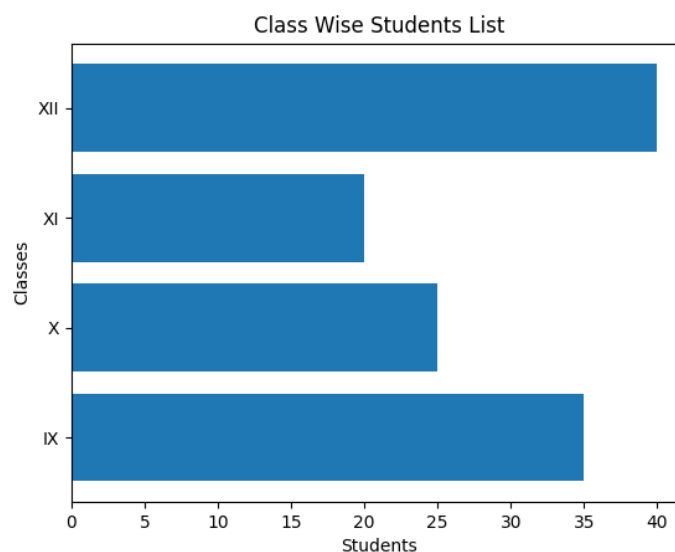
Answer)

```
import pandas as pd
import matplotlib.pyplot as plt
min_temp=[6,5,6,5,5,5,4,9,11,12,14,15,12,13,11,11,8,7,10,10,9,9,7,8,9,5,6,6,7,10]
plt.hist(min_temp,bins=5,color="brown",edgecolor="black")
plt.title("Minimum Temperatures in city Newyork During November 2022")
plt.ylabel("Frequency")
plt.xlabel("Temperature")
plt.show()
```

(Or)

Write a program to display the following chart.

Give titles for x-axis, y-axis and whole chart as shown in the below picture.



Ans)

```
import matplotlib.pyplot as myplot
Class=['IX','X','XI','XII']
Students=[35,25,20,40]
```

```

myplot.barh(Class,Students)
myplot.xlabel('Students')
myplot.ylabel('Classes')
myplot.title('Class Wise Students List')
myplot.show()

```

13. (a) Write the output of the following code:

```

import numpy as np
import pandas as pd
A=np.array([35,40,71])
B=np.array([27,34,np.NaN])
C=[11,22,33]
DF=pd.DataFrame([A,B,C])
print(DF)

```

```

      0      1      2
0  35.0  40.0  71.0
1  27.0  34.0   NaN
2  11.0  22.0  33.0

```

Answer)

(b) Fill in the blank to produce the following output.

```

      0      1      2
One  Sunil  Anand  Naresh
Two    95    78    99

```

```

import pandas as pd
L1=["Sunil","Anand","Naresh"]
L2=[95,78,99]
DF=pd.DataFrame([L1,L2],_____ )
print(DF)

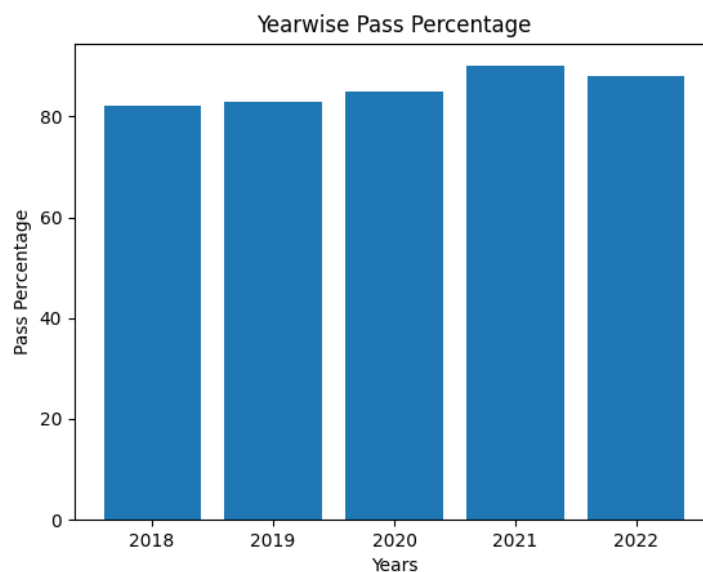
```

Answer) index=['One','Two']

SECTION – C

Each question carries 3 marks

14. Write a code to plot a bar chart to depict the pass percentage of students in “ABC University” exams for the years 2018 to 2022 as shown below:



Give titles for x-axis, y-axis and whole chart as shown in the above picture.

Answer)

```

import matplotlib.pyplot as plt

```

```
import numpy as np
Years=['2018', '2019', '2020', '2021','2022']
Percentage=[82,83,85,90,88]
plt.bar(Years, Percentage)
plt.xlabel("Years")
plt.ylabel("Pass Percentage")
plt.title("Yearwise Pass Percentage")
plt.show()
```

15. Create the following DataFrame “Trains” which contains the following train details.

	TrainNo	From	To
HydExp	17255	Narsapur	Lingampalli
NspExp	17256	Lingampalli	Narsapur
Pass	77233	Bhimavaram	Narsapur
Falaknuma	12704	Secunderabad	Howrah

Write a program to do the following operations:

- Create the dataframe
- Display the row labels
- Display the column labels

Answer):

```
import pandas as pd
dict={'TrainNo':[17255,17256,77233,12704],'From':
['Narsapur','Lingampalli','Bhimavaram','Secunderabad'],
      'To':['Lingampalli','Narsapur','Narsapur','Howrah']}
Trains=pd.DataFrame(dict,index=['HydExp','NspExp', 'Pass', 'Falaknuma'])
print(Trains)
print("\nRow Lables:\n",Trains.index)
#Display column lables
print("\nColumn Lables:\n",Trains.columns)
```

(Or)

Create the following DataFrame “Trains” which contains the following train details.

	TrainNo	From	To
HydExp	17255	Narsapur	Lingampalli
NspExp	17256	Lingampalli	Narsapur
Pass	77233	Bhimavaram	Narsapur
Falaknuma	12704	Secunderabad	Howrah

Write a program to do the following operations:

- Create the dataframe
- Display the data types of each column
- Display the no.of dimensions, its shape and its size

Answer):

```
import pandas as pd
dict={'TrainNo':[17255,17256,77233,12704],'From':
['Narsapur','Lingampalli','Bhimavaram','Secunderabad'],
      'To':['Lingampalli','Narsapur','Narsapur','Howrah']}
```

```
Trains=pd.DataFrame(dict,index=['HydExp','NspExp', 'Pass', 'Falaknuma'])
print(Trains)
print("\nDisplay column data types")
print(Trains.dtypes)
print("\nDimensions:",Trains.ndim)
print("Shape:",Trains.shape)
print("Size:",Trains.size)
```

16. Write a program to perform the following operations on the DataFrame Object DF.

Given Data:

Name	Age	Class
Pavan	15	X
Kumar	16	XI
Santosh	16	XII

- (i) Create the above DataFrame DF with index as 'Stu1', 'Stu2', 'Stu3'.
- (ii) Modify the Kumar age as 15
- (iii) Rename index "Stu3" to "Student3"
- (iv) Add the row Nani-17-XII
- (v) Delete the details regarding Pavan.
- (vi) Write a statement to print DataFrame. Also write the final DataFrame output.

Answer):

```
import pandas as pd
dict= {'Name':['Pavan','Kumar','Santosh'],'Age':[15,16,16],'Class':['X','XI','XII']}
DF=pd.DataFrame(dict,index=['Stu1','Stu2','Stu3'])
DF.at['Stu2','Age']=15
DF.rename(index={'Stu3':'Student3'},inplace=True)
DF.at['Stu4']=['Nani',17,'XII']
DF.drop(["Stu1"],axis=0,inplace=True)
print(DF)
```

Output:

```

           Name  Age Class
Stu2      Kumar  15.0    XI
Student3  Santosh  16.0   XII
Stu4       Nani  17.0   XII
```

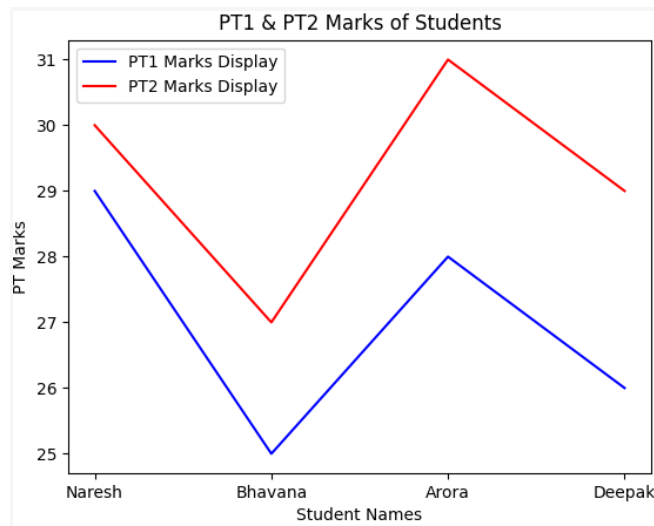
SECTION – D

It carries 4 marks

17. Plot the following data on line chart:

Name/Marks	CT1	CT2
Naresh	29	30
Bhavana	25	27
Arora	28	31
Deepak	26	29

Plot one line chart in Blue colour and another in Red colour. Give appropriate titles for x-axis, y-axis and whole chart as shown in the following picture. Display legends as in the picture.



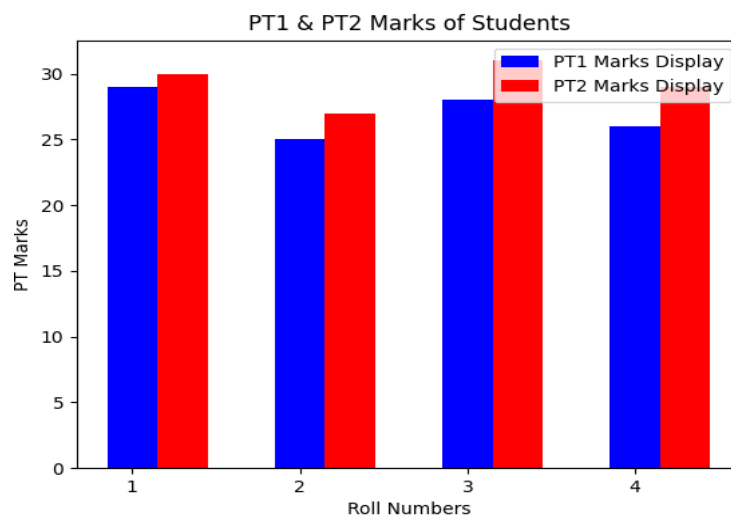
Answer). `import matplotlib.pyplot as myplot`
`PT1=[29,25,28,26]`
`PT2=[30,27,31,29]`
`Names=['Naresh','Bhavana','Arora','Deepak']`
`myplot.plot(Names,PT1,'blue',label='PT1 Marks Display')`
`myplot.plot(Names,PT2,'red',label='PT2 Marks Display')`
`myplot.xlabel('Student Names')`
`myplot.ylabel('PT Marks')`
`myplot.title('PT1 & PT2 Marks of Students')`
`myplot.legend(loc=2)`
`myplot.show()`

(Or)

Plot the following data on bar chart:

Name/Marks	CT1	CT2
Naresh	29	30
Bhavana	25	27
Arora	28	31
Deepak	26	29

Plot one bar chart in Blue colour and another in Red colour. Give appropriate titles for x-axis, y-axis and whole chart as shown in the following picture. Display legends as in the picture. Take width of each bar as 0.2 or 0.3.



SECTION – E

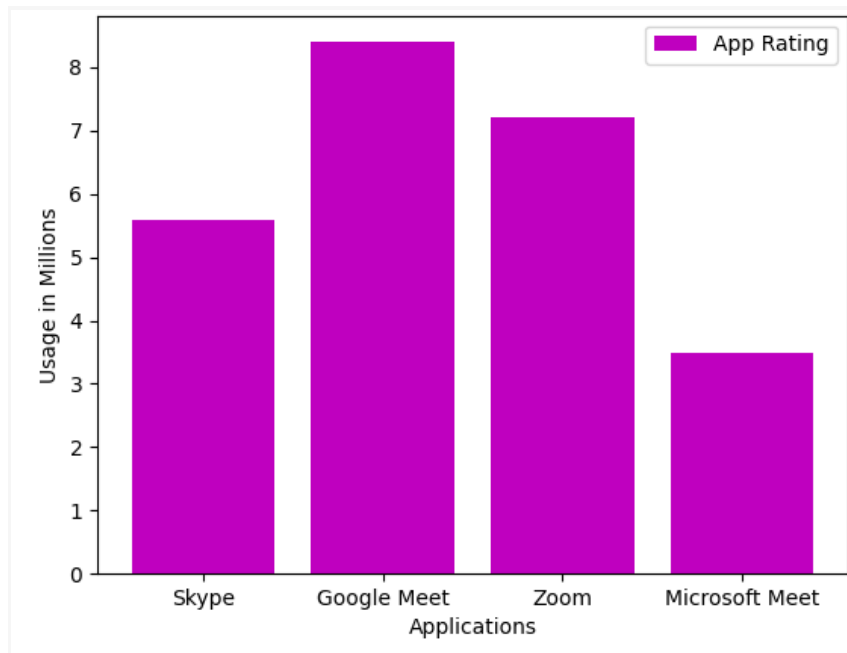
It carries 5 marks

18. Mr. Mohan is working in the online usage statistics company. Presently his company is working in the online usage statistics of “Online Usage of Different Video Conference” apps.

Following is the details:

AppName	Usage
Skype	5.6
Google Meet	8.4
Zoom	7.2
Microsoft Teams	3.5

He was comparing the given chart on the basis of the rating of the various apps available on the play store.



He is trying to write a code to plot the graph.

Help Mr. Mohan to fill in the blanks of the code and get the desired output.

Program:

```
import _____ as plt #Statement 1
videoapps=["Skype","Google Meet","Zoom","Microsoft Meet"]
usage=[5.6, 8.4, 7.2, 3.5]
plt._____(videoapps, usage, color='m', label=_____) #Statement 2 Statement 3
plt._____ #Statement 4
plt._____ #Statement 5
plt._____ #Statement 6
plt._____ #Statement 7
```

- Write the appropriate statement for #statement 1 to import the module. **A) matplotlib.pyplot**
- Write the function name and label name as displayed in the output for #statement 2 and #statement 3 respectively. **A) bar, Application Usage**
- Which word should be used for #statement 4 to display on x-axis “Applications”, #statement 5 to display on y-axis “Usage in Millions”? **A) xlabel(“Applications”), ylabel(“Usage in Millions”)**
- Write appropriate method names for #Statement 6 to display legends and #Statement 7 to display the figure. **A) legend(loc=1), show()**

v) Mr. Mohan wants to change the chart type to horizontal bar chart. Which statement should be updated and which method or function is used?

A) Statement 2 should be changed. It requires `barh()` method to plot the data.