PRACTICE PAPER (ON) COMPLETE PYTHON SYLLABUS
TERM –I KEY PAPER
2022-23

Name of the student:

Grade: XII **Time: 3 Hours**

Subject: IP **KEY PAPER** **Marks: 70**

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( )

A) (d) pl.title( )

2. CSV stands for
(a) Common Separation Value (b) Comma Separated Values
(c) Common Separation Values (d) Comma Separated Value

A) (b) Comma Separated Values

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

A) (c) Both statements A and B are incorrect

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

A) (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])

A) (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

A) (d) Both a and c

7. In a DataFrame, Axis= 1 represents the_____ elements.

A. column

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.

A) (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

A. (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

A) (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

A) (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

A) (a) Dictionary of tuples

13. Which library is imported to draw charts in Python?

(a) csv (b) matplotlib (c)numpy (d) pandas

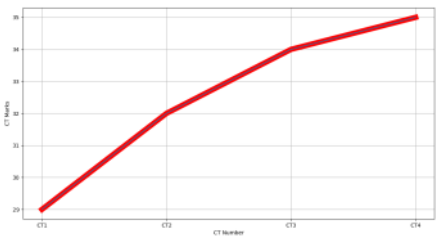
A) (b) matplotlib

14. _____ is the function to save the graph.

(a) Savefig() (b) Savefigure() (c) Savegraph() (d) Savechart()

A) (a) Savefig( )

15. Identify the linestyle of the following line chart.



(a) dashed (b) solid (c) dash dot (d) dotted

A) (b) solid

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.

A) df=pd.read_csv("D:\\XII\\Marks.csv", nrows=3)

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._____("_____")
```

A) Df.to_csv("D:\School\toppers.csv")

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

A) (a) Key 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

A) (c) L4**

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()

A) (c) read_csv( )

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

A) (c) loc() is label based function and iloc() integer position based function.

SECTION-I1

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

A) (b)df.columns

(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

A. (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

A) (a) df.dtypes

(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

A) (c)df.axes

(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

A) (b) df.values

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 7pl

A) (a) 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

A) (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

A) (b) Line Chart

(iv) Name the function to create a line chart from the following:

(a) bar( ) (b) hist( ) (c)plot( ) (d) scatter( )

A) (c)plot( )

(v) A _____is a color or mark linked to a specific data range plotted.

(a) color (b)legend (c)edge color (d) color mark

A) (b)legend

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)

A) Program:

```
import pandas as pd
df=pd.read_csv("C:\\Expenditure\\rates.csv")
print(df)
```

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]])

Ans) (b) df=pd.DataFrame(data=[2,3,4,5],index=[True,True,False,True])

(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']]

A) (c) 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())

A)

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

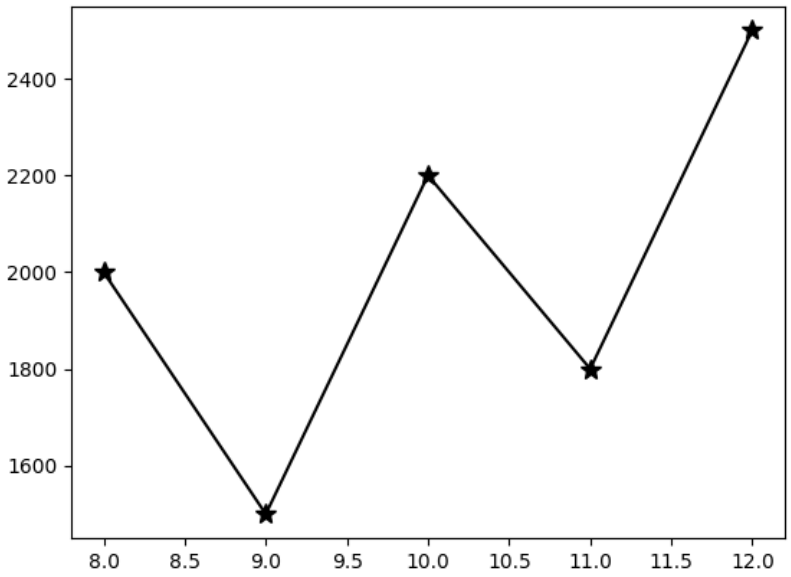
(ii) print(Vegetables.head(3))

A)

```
45          Brinjal
35    Ladies Finger
20            Onion
dtype: object
```

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')

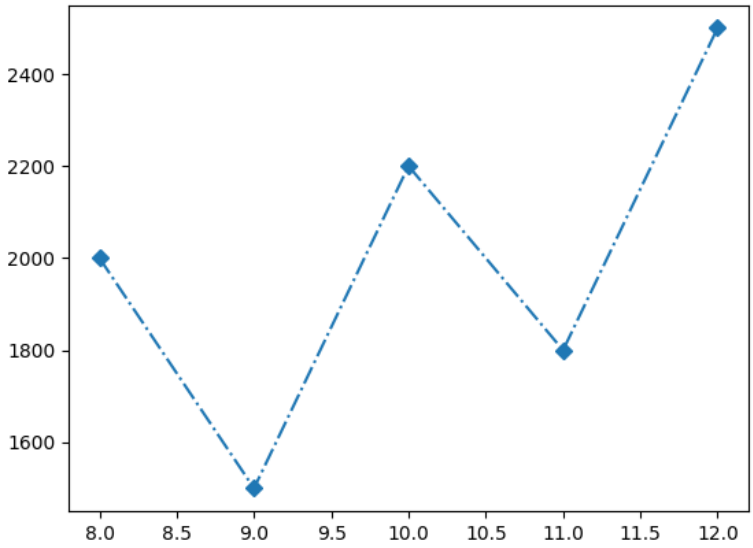
(b) plt.plot(x,y,marker='*',markersize=10,color='k')

(c) plt.plot(x,y,marker='star',markersize=10')

(d) plt.plot(x,y,marker='@',markersize=10,color='m',linestyle='dashdot')

A) (b) plt.plot(x,y,marker='*',markersize=10,color='k')

(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')

A) (a) plt.plot(a,b,marker='D',ls='dashdot')

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

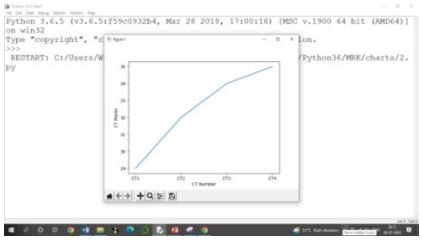
8,9,10,11,12,15,25,22,7,5,45,48,56,25,48,59,36

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

A) Program:

```
import matplotlib.pyplot as plt
ages=[8,9,10,11,12,15,25,22,7,5,45,48,56,25,48,59,36]
plt.hist(ages)  #  plt.hist([8,9,10,11,12,15,25,22,7,5,45,48,56,25,48,59,36])
plt.show()
```

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.

A) plt.figure(figsize=(15,7))

(ii) Write a statement to display grid lines.

A) plt.grid(True)

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))

```
0    2
1    2
2    2
dtype: int64
```

A) **# 1 means, axis=columns**

(ii) print(df.shape[0])

A) 3 **# will give number of rows**

(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".

(A) df.rename(index={0:"Zero"},inplace=True)

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

(A) df.rename(columns={"Price":"Cost"},inplace=True)

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

```
0    10
1    15
2    21
3    25
```

S1

```
0     5.5
1     7.0
2    12.0
```

S2

(i) print(S1*S2)

```
0     55.0
1    105.0
2    252.0
3      NaN
dtype: float64
```

(ii) print(S2-S1)

```
0   -4.5
1   -8.0
2   -9.0
3    NaN
dtype: float64
```

31. Differentiate between Series and DataFrames.

Property	Series	DataFrame
Dimensions	1 Dimensional	2-Dimensional
Type of Data	Homegeneous, i.e., all the elements must be of same type in a Series object	Heterogeneous, i.e., a DataFrame object can have elements of different data types
Mutability	Value mutable, i.e., their elements value can change	Value mutable, i.e., their elements value can change
	Size-immutable, i.e., size of a Series object, once created, cannot change. It we want to add/drop an element, internally a new Series object will be created	Size-mutable,i.e., size of a Dataframe object, once created, can change in place. That is, you can add/drop elements in an existing dataframe object.

32. Consider the following Series "S"

```
First     75
Second    88
Third     95
```

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

A) S["First"]=85

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

A) S.index=["One","Two","Three"]

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

```
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).

A) Value.sort_values(ascending=False,inplace=True)

(ii) Write the output after sorting is completed.

Ans)

A)
```
2    12
0    10
3     7
1    -5
dtype: int64
```

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"

A) horizontal, vertical

(ii) Write 4 property values for" histtype"

A) bar, barstacked, step, stepfilled

(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

A) (c) Statement A is correct, but Statement B is incorrect

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.

A) Fruits.head(3)

(ii) Write the output of the statement: print(Fruits[Fruits>20])

A)

```
Apple     25
Popaya    35
dtype: int64
```

(iii) Write the output of the statement: print(Fruits>20)

```
Apple      True
Mango     False
Popaya     True
Lemon     False
dtype: bool
```

(OR)

Assuming the given series, named "S" 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])**

A)

```
CT3      31
CT4      33
Term1    58
Term2    65
dtype: int64
```

```
Term2    65
Term1    58
CT4      33
CT3      31
CT2      29
CT1      32
dtype: int64
```

```
CT2    29
CT4    33
dtype: int64
```

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))

Ans)

```
     A      B      C
0  101.0  202.0  303.0
1  404.0  505.0  606.0
2    NaN    NaN    NaN
```

(ii) print(DF1.rsub(DF2))

```
     A      B      C
0   99.0  198.0  297.0
1  396.0  495.0  594.0
2    NaN    NaN    NaN
```

(iii) print(DF3*DF1)

```
     A       B   C
0   50.5   500.0 NaN
1  602.0  1752.5 NaN
2    NaN     NaN NaN
```

(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

A)

Program:

```
import pandas as pd
dict={'Stu':[10,15],'Present':[22,25]}
df=pd.DataFrame(dict,index=["First","Second"])
for (row,rowSeries) in df.iterrows():
    print("Row index:",row)
    print(rowSeries)
```

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.

Program:

```
import pandas as pd
Tablets=pd.Series(['BP','Sugar','Fever','Cold'],index=['Taxim','Glycomet','Paracetmol','Vicks'])
print(Tablets)
```

Output

```
Taxim            BP
Glycomet      Sugar
Paracetmol    Fever
Vicks          Cold
dtype: object
```

2 Marks for Program, 1 mark for output.

SECTION – III

38. Consider the following Series Object "S" and write the outputs for the following:

```
Eng    92
Mat    85
Phy    79
Che    95
Bio    45
IP     77
dtype: int64
```

(i) print(S.index)

A) Index(['Eng', 'Mat', 'Phy', 'Che', 'Bio', 'IP'], dtype='object')

(ii) print(S.shape)

A) (6,)

(iii) print(S.hasnans)

A) False

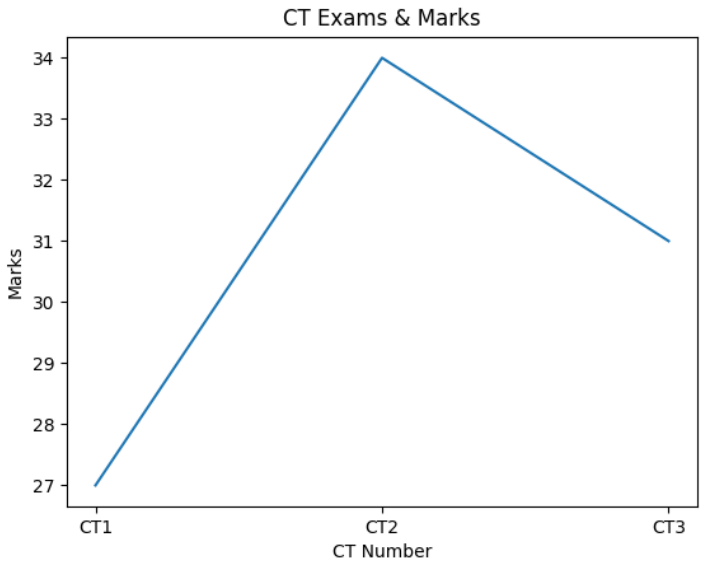
(iv) print(S.nbytes)

A) 48

(v) print(S.dtype)

A) dtype('int64')

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



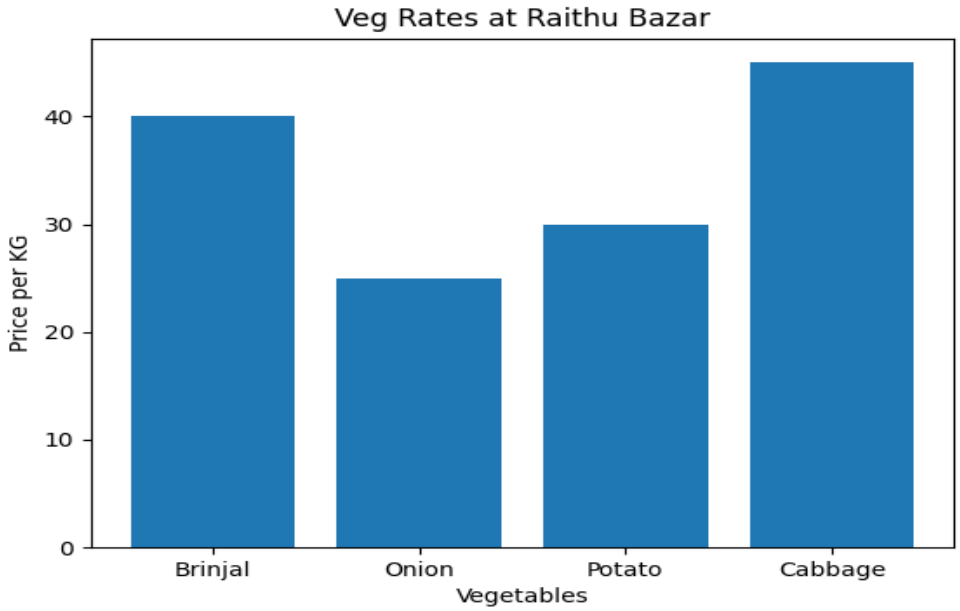
Program:

```
import matplotlib.pyplot as plt
a = ['CT1','CT2','CT3']
b = [27,34,31]
plt.plot(a,b)          # plt.plot(['CT1','CT2','CT3'],[27,34,31])
plt.xlabel("CT Number")
plt.ylabel("Marks")
plt.title("CT Exams & Marks")
plt.show()
```

1 mark for the import statement, 1 mark for appropriate usage of plot(),1 mark for xlabel and ylabel
1 mark for title, 1 mark for show()

(OR)

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



Program:

```
import matplotlib.pyplot as plt
Vegetables = ['Brinjal','Onion','Potato','Cabbage']
Cost = [40,25,30,45]
plt.bar(Vegetables, Cost)
# plt.bar(['Brinjal','Onion','Potato','Cabbage'],[40,25,30,45])
plt.xlabel("Vegetables")
plt.ylabel("Price per KG")
plt.title("Veg Rates at Raithu Bazar")
plt.show()
```

1 mark for the import statement, 1 mark for appropriate usage of bar() ,1 mark for xlabel and ylabel
1 mark for title, 1 mark for show()

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)

A) import pandas as pd

```
dict={'Rollno':[1,2,3,4],'Name':['Kamal','Praneeth','Naveen','Mukesh'],'Marks':[92,87,82,75]}
df=pd.DataFrame(dict,index=["One","Two","Three","Four"])
print(df)
```

(ii) Add a new column "Hobbies" with values "Swimming","Dance","Music","Dance" to the DataFrame df (1m)

A)
```
df["Hobbies"]=["Swimming","Dance","Music","Dance"]
```
(or)
```
df.loc[:,"Hobbies"]=["Swimming","Dance","Music","Dance"]
```
(or)
```
df.loc[:,"Hobbies"]="Swimming","Dance","Music","Dance"
```
(or)
```
df.at[:,"Hobbies"]=["Swimming","Dance","Music","Dance"]
```
(or)
```
df.at[:,"Hobbies"]="Swimming","Dance","Music","Dance"
```
(or)
```
df=df.assign(Hobbies=["Swimming","Dance","Music","Dance"])
```

(iii) Add a new row with the following values (5,"lokesh",85) with index "Five" (1m)
(Consider the original data only)

Ans)
```
df.at['Five']=[5,"Lokesh",85]
```
(or)
```
df.at['Five',:]=[5,"Lokesh",85]
```
(or)
```
df.at['Five']=5,"Lokesh",85
```
(or)
```
df.at['Five',:]=5,"Lokesh",85
```
(or)
```
df.loc['Five',:]=5,"Lokesh",85
```
(or)
```
df.loc['Five']=5,"Lokesh",85
```
(or)
```
df.loc['Five',:]=[5,"Lokesh",85]
```
(or)
```
df.loc['Five']=[5,"Lokesh",85]
```

(iv) Write a statement to change the data in DataFrame from "Praneeth" to "Kiran". (1m)

Ans)
```
df.Name["Two"]="Kiran"
```
(or)
```
df.Name[1]="Kiran"
```
(or)
```
df.at["Two","Name"]="Kiran"
```
(or)
```
df.iat[1,1]="Kiran"
```
(or)
```
df.loc["Two","Name"]="Kiran"
```
(or)
```
df.iloc[1,1]="Kiran"
```