

KENDRIYA VIDYALAYA SANGATHAN

STUDY MATERIAL

CLASS XII

INFORMATICS PRACTICES (065)

2019-20



CHANDIGARH REGION

STUDY MATERIAL FOR HIGH ACHIEVERS OF CLASS XII

(INFORMATICS PRACTICES)

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- Subject Co-ordinator: Sh. Sonu Kumar (PGT Comp. Sc.)
K. V. No. 2 Army Area, Pathankot
- Contributors :-
1) Gulshan Arora (PGT CS)
K. V Baddowal Cantt
2) Jitin Kohli (PGT CS)
K.V No.1 Pathankot
3) Harjinder Singh (PGT CS)
K.V No.2 Jalandhar Cantt.
4) Upendra Bhatt (PGT CS)
K.V No.1 Jalandhar Cantt.
5) Mr. Mohit Singhal (PGT CS)
K.V No.2 RCF Hussainpur

Salient features of this Study Material

- This study material is in the form of Question Bank comprising of solved questions from each chapter of the syllabus.
- It is a collection of a number of challenging questions based on High Order Thinking Skill of students.
- It aims at providing help to very high scorer students who may miss 100 out of 100 because of not being exposed to new type of questions, being used to only conventional types of questions and not paying attention towards the topics which are given in the reference books and syllabus of Informatics Practices as per CBSE guidelines.
- It contains guidelines, hints and solutions for really challenging questions and topics.
- It contains a number of fresh/new questions (solved), which shall increase the confidence level of the students when they will solve them as per CBSE guidelines.
- Such kind of questions shall draw the attention of both the students and the teachers, and will help all of us in achieving the aim of 100% result with healthy PI.

“Things work out best for those who make the best of how things work out.”

ALL THE BEST TO OUR DEAR STUDENTS.....

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Topic : Numpy

1. What is Numpy?
2. Why Numpy is used over Lists?
3. Write a Numpy program to get the Numpy version ?
4. Write Numpy Program to test whether none of the elements of a given array is zero.
5. Write a Numpy program to create an array of 10 zeros, 10 ones and 10 fives.
6. Write a Numpy program to find the number of rows and columns of the given matrix.
7. Write a Numpy program to compute sum of all elements, sum of each column and sum of each row of a matrix.
8. Write a Numpy program to convert a given array into a list and then convert it into a array again.
9. Write a Numpy program to create a 1 D array with values from 0 to 9
10. Write a NumPy program to reverse an array (first element becomes last).
Original array:
`[12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37]`
Reverse array:
`[37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12]`
11. Write a NumPy program to create a 2d array with 1 on the border and 0 inside.
Expected Output:
Original array:
`[[1. 1. 1. 1. 1.]
[1. 1. 1. 1. 1.]
[1. 1. 1. 1. 1.]
[1. 1. 1. 1. 1.]
[1. 1. 1. 1. 1.]]`
1 on the border and 0 inside in the array
`[[1. 1. 1. 1. 1.]
[1. 0. 0. 0. 1.]
[1. 0. 0. 0. 1.]
[1. 0. 0. 0. 1.]
[1. 1. 1. 1. 1.]]`
12. Write a NumPy program to append values to the end of an array.
Expected Output:
Original array:
`[10, 20, 30]`
After append values to the end of the array:
`[10 20 30 40 50 60 70 80 90]`
13. Write a NumPy program to find common values between two arrays.

Expected Output:

Array1: [0 10 20 40 60]

Array2: [10, 30, 40]

Common values between two arrays:

[10 40]

14. Write a NumPy program to compute the covariance matrix of two given arrays.
15. Write a NumPy program to compute cross-correlation of two given arrays.
16. Write a NumPy program to compute the mean, standard deviation, and variance of a given array along the second axis.

Sample output:

Original array:

[0 1 2 3 4 5]

Mean: 2.5

std: 1

variance: 2.9166666666666665

17. Write a NumPy program to generate six random integers between 10 and 30.

Expected Output:

[20 28 27 17 28 29]

18. What is covariance ?
19. What is Linear Regression?

Answers Of Numpy

1. NumPy is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays. It is the fundamental package for scientific computing with Python. A powerful N-dimensional array object.

2. NumPy uses much less memory to store data

The NumPy arrays takes significantly less amount of memory as compared to python lists. It also provides a mechanism of specifying the data types of the contents, which allows further optimisation of the code.

```
3. import numpy as np
print(np.__version__)
print(np.show_config())
```

4. import numpy as np

```
x = np.array([1, 2, 3, 4])
print("Original array:")
print(x)
print("Test if none of the elements of the said array is zero:")
print(np.all(x))
x = np.array([0, 1, 2, 3])
print("Original array:")
print(x)
print("Test if none of the elements of the said array is zero:")
print(np.all(x))
```

5. import numpy as np

```
array=np.zeros(10)
print("An array of 10 zeros:")
print(array)
array=np.ones(10)
print("An array of 10 ones:")
print(array)
array=np.ones(10)*5
print("An array of 10 fives:")
print(array)
```

6. import numpy as np

```
m= np.arange(10,22).reshape((3, 4))
print("Original matrix:")
print(m)
print("Number of rows and columns of the said matrix:")
print(m.shape)
```

7. import numpy as np

```
x = np.array([[0,1],[2,3]])
print("Original array:")
print(x)
print("Sum of all elements:")
print(np.sum(x))
print("Sum of each column:")
print(np.sum(x, axis=0))
print("Sum of each row:")
print(np.sum(x, axis=1))
```

```
8. import numpy as np
a = [[1, 2], [3, 4]]
x = np.array(a)
a2 = x.tolist()
print(a == a2)
```

```
9. import numpy as np
x = np.arange(10)
print("Array from 0 to 9:")
print(x)
```

```
10. import numpy as np
import numpy as np
x = np.arange(12, 38)
print("Original array:")
print(x)
print("Reverse array:")
x = x[::-1]
print(x)
```

```
11. import numpy as np
x = np.ones((5,5))
print("Original array:")
print(x)
print("1 on the border and 0 inside in the array")
x[1:-1,1:-1] = 0
print(x)
```

```
12. import numpy as np
x = [10, 20, 30]
print("Original array:")
print(x)
x = np.append(x, [[40, 50, 60], [70, 80, 90]])
print("After append values to the end of the array:")
print(x)
```



```
13. import numpy as np
array1 = np.array([0, 10, 20, 40, 60])
print("Array1: ",array1)
array2 = [10, 30, 40]
print("Array2: ",array2)
print("Common values between two arrays:")
print(np.intersect1d(array1, array2))
```

```
14. import numpy as np
x = np.array([0, 1, 2])
y = np.array([2, 1, 0])
print("\nOriginal array1:")
print(x)
print("\nOriginal array1:")
print(y)
print("\nCovariance matrix of the said arrays:\n",np.cov(x, y))
```

```
15. import numpy as np
x = np.array([0, 1, 3])
y = np.array([2, 4, 5])
print("\nOriginal array1:")
print(x)
print("\nOriginal array1:")
print(y)
print("\nCross-correlation of the said arrays:\n",np.cov(x, y))
```

```
16. import numpy as np
x = np.arange(6)
print("\nOriginal array:")
print(x)
r1 = np.mean(x)
r2 = np.average(x)
assert np.allclose(r1, r2)
print("\nMean: ", r1)
r1 = np.std(x)
r2 = np.sqrt(np.mean((x - np.mean(x)) ** 2 ))
assert np.allclose(r1, r2)
print("\nstd: ", 1)
r1= np.var(x)
r2 = np.mean((x - np.mean(x)) ** 2 )
assert np.allclose(r1, r2)
print("\nvariance: ", r1)
```

```
17. import numpy as np
```

```
x = np.random.randint(low=10, high=30, size=6)
print(x)
```

18. Covariance provides the a measure of strength of correlation between two variable or more set of variables.

19. Simple linear regression is an approach for predicting a response using a single feature. It is assumed that the two variables are linearly related. Hence, we try to find a linear function that predicts the response value(y) as accurately as possible as a function of the feature or independent variable(x).

Topic : Python Pandas

HOTS Questions

1. What is pandas series?
2. What is dataframe?
3. Write a python code to create an empty Dataframe?
4. How can we fill missing values in dataframe?
5. What is quartile? How it is related to quantile? How do you generate in Pandas?
6. What is pivoting? Which function of pandas support pivoting?
7. what is the use of aggregation in python
8. How pivot_table() is different from pivot() when both perform pivoting?
9. Write a Pandas program to create and display a one-dimensional array-like object containing an array of data.
10. What are differences between reindex() and rename()?
11. What is the use of pipe() in python pandas?
12. Write python statements to create a data frame for the following data.

Name	Age	Designation
RAJIV	20	CLERK
SAMEER	35	MANAGER
KAPIL	45	ACCOUNTANT
13. Write one python program to find the following from the given dataframe DF:

Rollno	Name	Age	Marks
11	Aruna	18	68
12	Mohini	14	47
13	Kiya	13	78
14	Lakshmi	16	87
15	Ravisha	14	60

 - a) Maximum marks and minimum marks
 - b) sum of all the marks
 - c) Mean and mode of age of the students
 - d) Count the no of rows present in the dataframe
14. Suppose a data frame contains information about student having columns rollno, name, class and section. Write the code for the following:
 - (i) Add one more column as fee
 - (ii) Write syntax to transpose data frame.
 - (iii) Write python code to delete column fee of data frame.
 - (iv) Write the code to append df2 with df1
15. Assume following data is stored in data frame named as df1
Write following commands:
 - (i) Find total sales per state
 - (ii) find total sales per employee
 - (iii) find total sales both employee wise and state wise

(iv) find mean, median and min sale state wise

(v) find maximum sale by individual

Name of

Employee	Sales	Quarter	State
RSahay	125600	1	Delhi
George	235600	1	Tamil Naidu
JayaPriya	213400	1	Kerala
ManilaSahai	189000	1	Haryana
RymaSen	456000	1	West Bengal
ManilaSahai	172000	2	Haryana
JayaPriya	201400	2	Kerala

16. Write Output for the following code ?

```
import pandas as pd
data = [{'a': 1, 'b': 2}, {'a': 5, 'b': 10, 'c': 20}]
#With two column indices, values same as dictionary keys
df1 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b'])
#With two column indices with one index with other name
df2 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b1'])
print df1
print df2
```

17. Write a Pandas program to get the powers of an array values element-wise.

Note: First array elements raised to powers from second array

Sample data: {'X':[78,85,96,80,86], 'Y':[84,94,89,83,86], 'Z':[86,97,96,72,83]}

Expected Output:

```
  X  Y  Z
0 78 84 86
1 85 94 97
2 96 89 96
3 80 83 72
4 86 86 83
```

18. Write a Pandas program to create and display a DataFrame from a specified dictionary data which has the index labels.

Sample DataFrame:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',
                     'Laura', 'Kevin', 'Jonas'],
             'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
             'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
             'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

19. Write a Pandas program to select the rows where the number of attempts in the examination is greater than 2.

Sample DataFrame:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',  
'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

20. Write a Pandas program to select the rows the score is between 15 and 20 (inclusive).

Sample DataFrame:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',  
'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

21. Write a Pandas program to select the specified columns and rows from a given DataFrame. Select 'name' and 'score' columns in rows 1, 3, 5, 6 from the following data frame.

Sample DataFrame:

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew',  
'Laura', 'Kevin', 'Jonas'],  
'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],  
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

Answers

1. Pandas Series is a one-dimensional labeled array capable of holding data of any type (integer, string, float, python objects, etc.) . The axis labels are collectively called index. Pandas Series is nothing but a column in an excel sheet.
2. Python | Pandas DataFrame. Pandas DataFrame is two-dimensional size-mutable, potentially heterogeneous tabular data structure with labeled axes (rows and columns). A Data frame is a two-dimensional data structure, i.e., data is aligned in a tabular fashion in rows and columns.
3. Import pandas as pd
Df=pd.DataFrame()
Print(df)
4. Df=df1.fillna(0)
5. A quartile is a type of quantile. The first quartile is defined as the middle number between the smallest number and the median of the data set. The second quartile is the median of the data. The third quartile is the middle value between the median and the highest value of the data set
Pandas dataframe.quantile() function return values at the given quantile over requested axis, a numpy.percentile. Note : In each of any set of values of a variate which divide a frequency distribution into equal groups, each containing the same fraction of the total population.
6. Data pivoting is summarization technique to rearrange the coluns and rows in a report so as to view data from different perspectives.
Pandas library makes available two functions for pivoting – the pivot() and pivot_table() function.
7. Dataframe.aggregate() function is used to apply some aggregation across one or more column. Aggregate using callable, string, dict, or list of string/callables. Most frequently used aggregations are: sum: Return the sum of the values for the requested axis. min: Return the minimum of the values for the requested axis.
8. pivot() is used for pivoting without aggregation. Therefor, it can't deal with duplicate values for one index/column pair.
9. import pandas as pd
ds = pd.Series([2, 4, 6, 8, 10])
print(ds)
10. The rename() function renames the existing indexes in dataframe whereas reindex() function is used to change the order or existing lables in dataframe
11. The method pipe() creates a pipe and returns a pair of file descriptors (r, w) usable for reading and writing, respectively.
12. import pandas as pd

```
d={'Name':['RAJIV','SAMEER','KAPIL'],
'Age':[20,35,45],'Designation':['CLERK','MANAGER','ACCOUNTANT']}
df=pd.DataFrame(d)
```

13.

```
a. print("Maximum marks = ", DF["Marks"].max())
print("Minimum marks = ", DF["Marks"].min())
b. print("Sum of marks = ", DF["Marks"].sum())
c. print("Mean of Age = ",DF["Age"].mean())
print("Mode of Age = ",DF["Age"].mode())
d. print("No of rows = ",DF.count())
```

14.

```
I. Df1['fee']=(100,200,300)
II. Df1=Df1.T
III. Df2.pop('fee')
        Df2=Df2.append(Df1)
```

15.

```
(i) pv1=pd.pivot_table(dfN,index=['State'], values=['Sales'],aggfunc=np.sum)
(ii) pv1=pd.pivot_table(dfN,index=['Name of Employee'], values=['Sales'],aggfunc=np.sum)
(iii) pv1=pd.pivot_table(dfN,index=['Name of Employee','State'],values=['Sales'],aggfunc=np.sum)
(iv) pv1=pd.pivot_table(dfN,index=['State'],values=['Sales'],aggfunc=[np.mean,np.min,np.max])
pv1=pd.pivot_table(dfN,index=['Name of Employee'],values=['Sales'],aggfunc=np.max)
```

16. #df1 output

```
a b
first 1 2
second 5 10
```

#df2 output

```
      a b1
first  1 NaN
second 5 NaN
```

17. import pandas as pd

```
df = pd.DataFrame({'X':[78,85,96,80,86], 'Y':[84,94,89,83,86],'Z':[86,97,96,72,83]});
print(df)
```

18. import pandas as pd

```
import numpy as np
```

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
             'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
             'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
             'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

```
df = pd.DataFrame(exam_data, index=labels)
print(df)
```

```
19. import pandas as pd
import numpy as np
```

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
             'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
             'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
             'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

```
df = pd.DataFrame(exam_data, index=labels)
print("Number of attempts in the examination is greater than 2:")
print(df[df['attempts'] > 2])
```

```
20. import pandas as pd
import numpy as np
```

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
             'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
             'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
             'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
```

```
df = pd.DataFrame(exam_data, index=labels)
print("Rows where score between 15 and 20 (inclusive):")
print(df[df['score'].between(15, 20)])
```

```
21. import pandas as pd
import numpy as np
```

```
exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
             'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
```



```
'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],  
'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']  
labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']  
  
df = pd.DataFrame(exam_data, index=labels)  
print("Select specific columns and rows:")  
print(df.iloc[[1, 3, 5, 6], [1, 3]])
```

PLOTTING WITH PYPLOT

Q1. What is data visualization? What is its significance?

Q2 What is Boxplot? How do you create it in Pyplot? Explain with an example.

Q3. What is quantile? Explain.

Q4. What is a cumulative histogram? How do you create it?

Q5. Given two arrays namely arr1 and arr2 each having 5 values. Create a scatter chart so that each data points gets a different color, different size. Keep the marker style as square.

Q6. What will be the output of the following code :

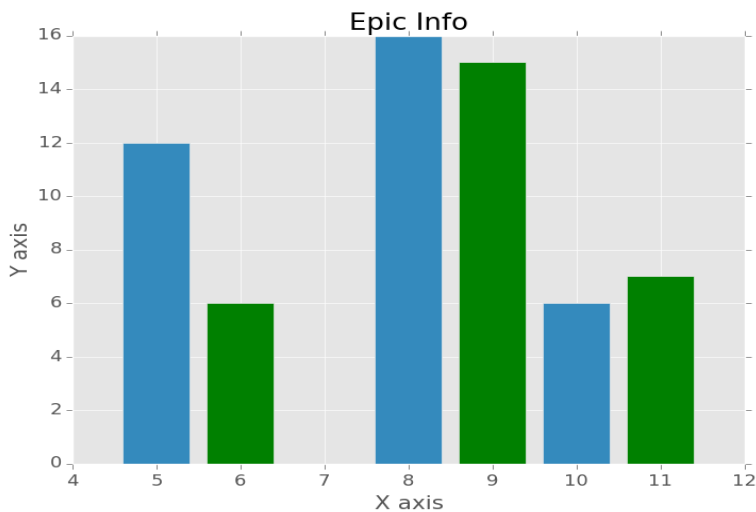
```
import matplotlib.pyplot as plt
plt.plot([1,2,3],[4,5,1])
plt.show()
```

Q7. From the following ordered set of data:

63, 65, 67, 69, 71, 71, 72, 74, 75, 78, 79, 79, 80, 81, 83

- a) Create a horizontal box plot.
- b) Create a vertical box plot.

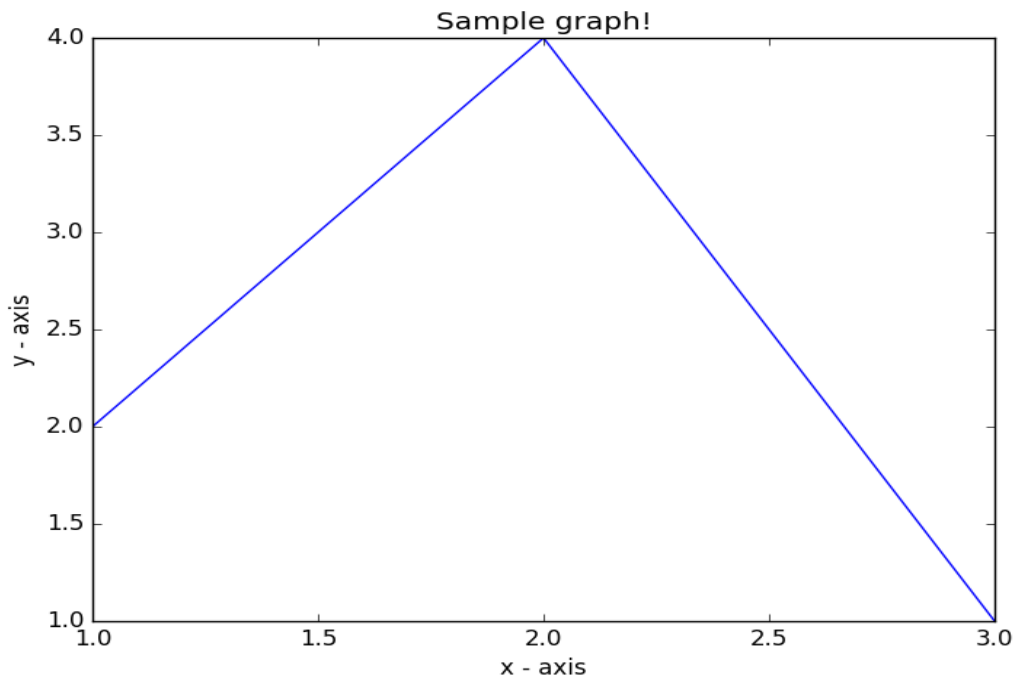
Q8 Complete the following code to draw the bar chart given:



```
from matplotlib import pyplot as plt
x = [5,8,10]
y = [12,16,6]
x2 = [6,9,11]
y2 = [6,15,7]
.....
```

(Complete Rest of the code)

Q9. Write a Python program to draw a line as shown below using given axis values with suitable label in the x axis , y axis and a title.



Q10. Write a Python program to draw line charts of the financial data of Alphabet Inc. between October 3, 2016 to October 7, 2016.

Sample Financial data (fdata.csv):

Date,Open,High,Low,Close

10-03-16,774.25,776.065002,769.5,772.559998

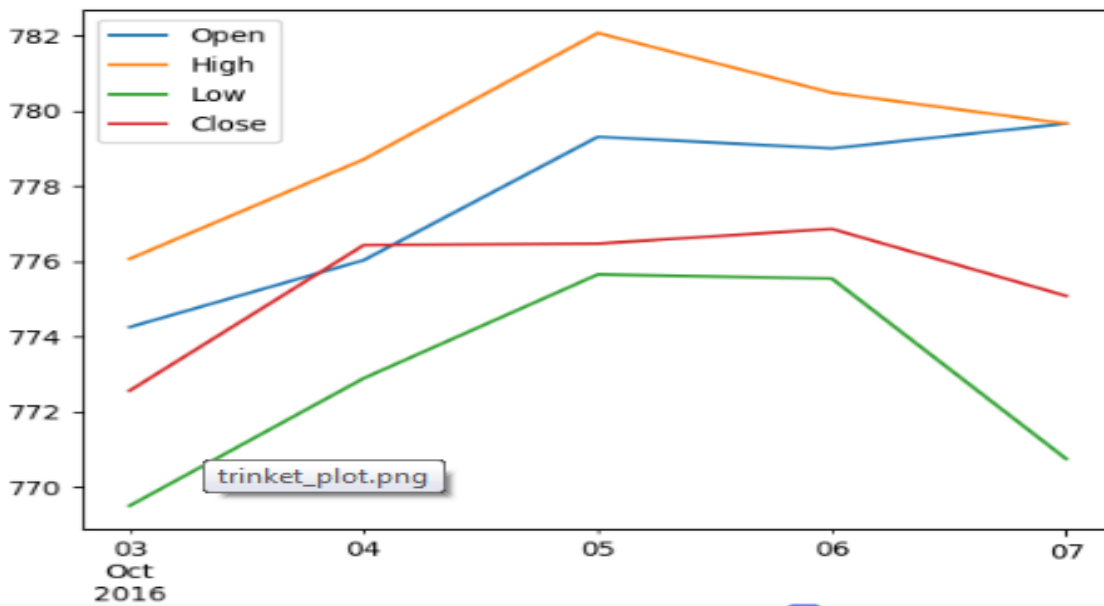
10-04-16,776.030029,778.710022,772.890015,776.429993

10-05-16,779.309998,782.070007,775.650024,776.469971

10-06-16,779,780.47998,775.539978,776.859985

10-07-16,779.659973,779.659973,770.75,775.080017

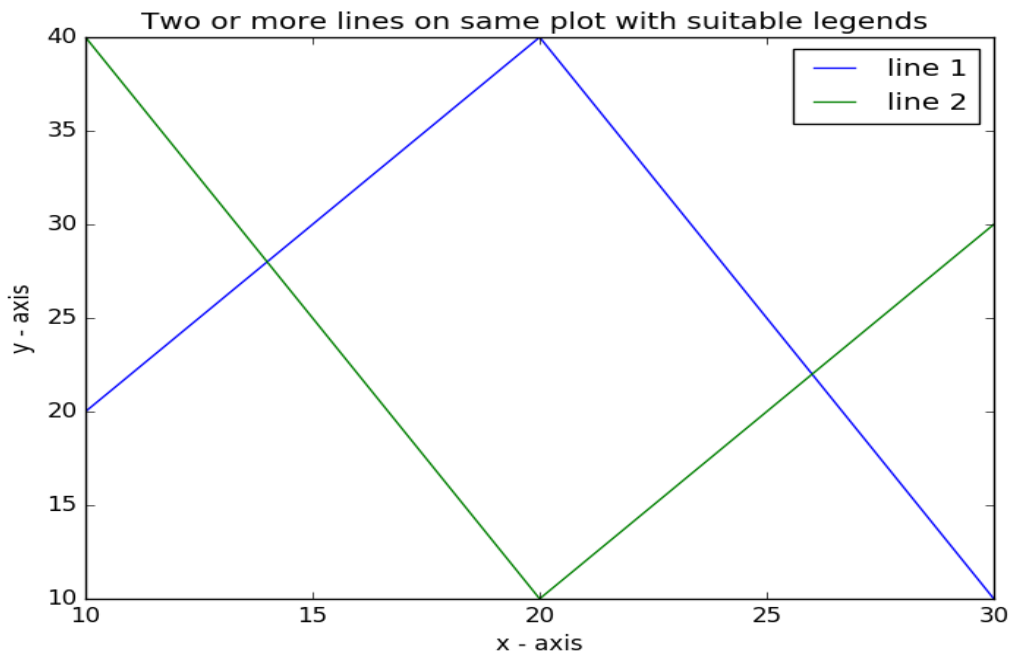
The code snippet gives the output shown in the following screenshot:



[trinket_plot.png](#)

Q11. Write a Python program to plot two or more lines on same plot with suitable legends of each line.

The code snippet gives the output shown in the following screenshot:



Q.12 Is there any function in pyplot to create frequency polygon? If no how can we create it.

SOLUTIONS

Ans 1:

Data visualization is the act of taking information (data) and placing it into a visual context, such as a map or graph. Data visualizations make big and small data easier for the human brain to understand, and visualization also makes it easier to detect patterns, trends, and outliers in groups of data.

Ans 2:

A Box Plot is the visual representation of the statistical five number summary of a given data set.

A Five Number Summary includes:

- Minimum
- First Quartile
- Median (Second Quartile)
- Third Quartile
- Maximum

Example

```
value1 = [72,76,24,40,57,62,75,78,31,32]
```

```
import matplotlib.pyplot as plt
```

```
A1 = [72,76,24,40,57,62,75,78,31,32]
```

```
box=plt.boxplot(A1)
```

```
plt.show()
```

Ans 3:

The word “quantile” comes from the word quantity. Means a quantile is where a sample is divided into equal-sized subgroups. It can also refer to dividing a probability distribution into areas of equal probability

Ans 4:

A cumulative histogram is a mapping that counts the cumulative number of observations in all of the bins up to the specified bin.

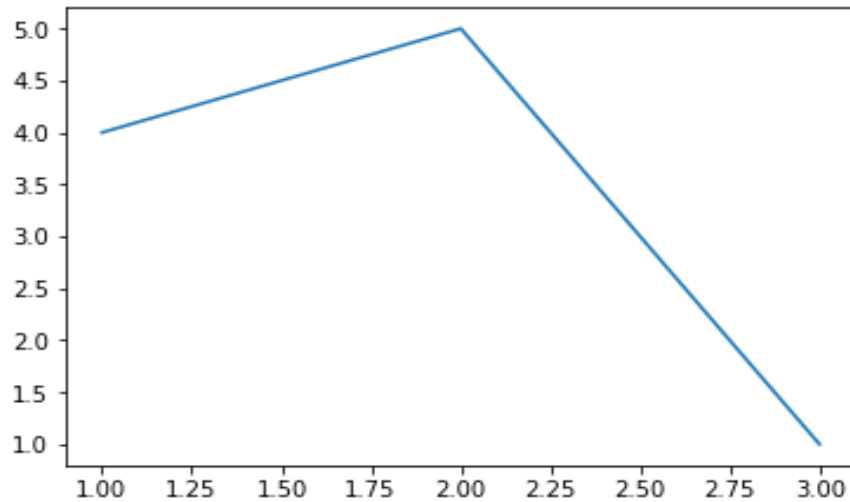
Example: A = [63, 65, 67, 69, 71]

```
plt.hist(A, cumulative = True)
```

Ans 5:

```
import matplotlib.pyplot as plt
ar1 = [2,4,6,8,10,12,14,16]
ar2 = [5,10,15,20,25,30,35,40]
colors = ['r', 'b', 'g', 'y', 'k']
sizes = [20,30,50,45,60]
plt.scatter(ar1,ar2,c = colors, s = sizes, marker = 's')
```

Ans 6:



Ans 7:

```
A = [63, 65, 67, 69, 71, 71, 72, 74, 75, 78, 79, 79, 80, 81, 83]
```

- (i) plt.boxplot(A1, bins = 5, vert = False)
- (ii) plt.boxplot(A1, bins = 5, vert = True)

Ans 8:

```
from matplotlib import pyplot as plt
x = [5,8,10]
y = [12,16,6]
x2 = [6,9,11]
y2 = [6,15,7]
plt.bar(x, y, align='center')
plt.bar(x2, y2, color='g', align='center')
plt.title('Epic Info')
plt.ylabel('Y axis')
plt.xlabel('X axis')
```

```
plt.show()
```

Ans 9:

```
import matplotlib.pyplot as plt

# x axis values
x = [1,2,3]
# y axis values
y = [2,4,1]
# Plot lines and/or markers to the Axes.
plt.plot(x, y)
# Set the x axis label of the current axis.
plt.xlabel('x - axis')
# Set the y axis label of the current axis.
plt.ylabel('y - axis')
# Set a title
plt.title('Sample graph!')
# Display a figure.
plt.show()
```

Ans 10:

```
import matplotlib.pyplot as plt

import pandas as pd

df = pd.read_csv('fdata.csv', sep=',', parse_dates=True, index_col=0)
df.plot()
plt.show()
```

Ans 11:

```
import matplotlib.pyplot as plt
# line 1 points
x1 = [10,20,30]
y1 = [20,40,10]
# plotting the line 1 points
plt.plot(x1, y1, label = "line 1")
# line 2 points
x2 = [10,20,30]
y2 = [40,10,30]
# plotting the line 2 points
plt.plot(x2, y2, label = "line 2")
plt.xlabel('x - axis')
# Set the y axis label of the current axis.
plt.ylabel('y - axis')
# Set a title of the current axes.
plt.title('Two or more lines on same plot with suitable legends ')
# show a legend on the plot
```

```
plt.legend()  
# Display a figure.  
plt.show()
```

Ans 12

There is not any pyplot function to create frequency polygon. We can create it by

1. Plot a histogram from the data
2. Mark a single point at the midpoint of an interval/bin
3. Draw straight lines to connect the adjacent points
4. Connect first data point to the midpoint of previous interval on x axis
5. Connect last data point to the midpoint of the following interval on x axis

For example we have a series name com that stores some 1000 values Plotting a step histogram from the same

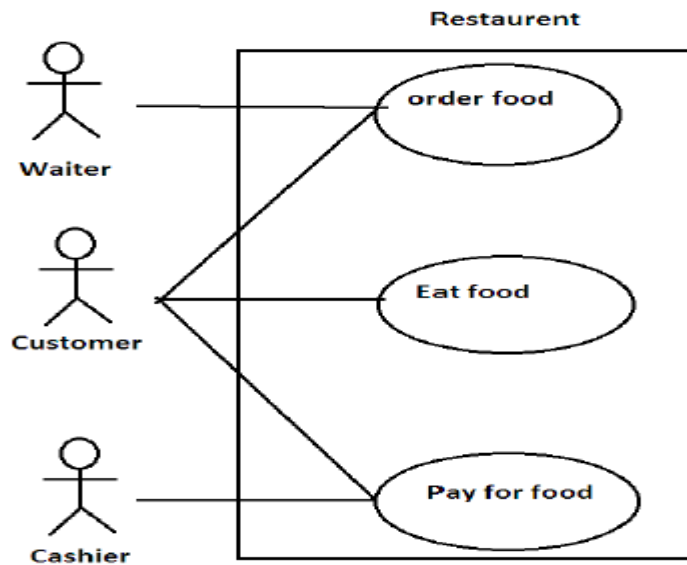
```
Pl.hist(com,bin=10,histtype='step')
```

Joining midpoint of each set of adjacent bins to create frequency polygon

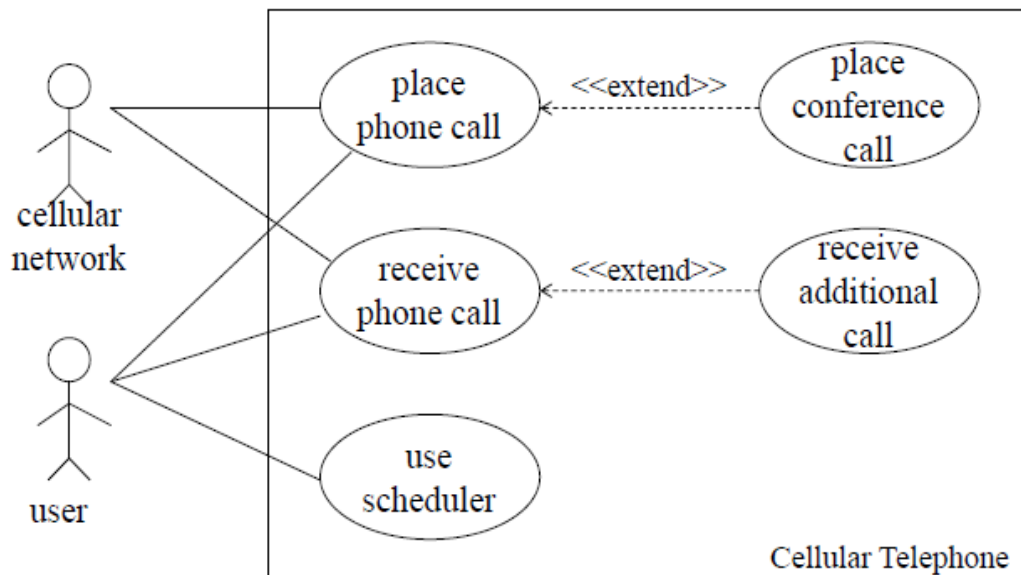
INTRODUCTION TO SOFTWARE ENGINEERING

AGILE METHODS AND PRACTICAL EXPECTS OF SOFTWARE ENGINEERING

1. Why software development requires SRS?
2. SRS stand for ____?
3. What is software increment?
4. What is verification?
5. What is validation?
6. What is system testing?
7. Which one of the following is NOT desired in a good Software Requirement Specifications (SRS) document?
 - (i) Functional Requirements
 - (ii) Non-Functional Requirements
 - (iii) Goals of Implementation
 - (iv) Algorithms for Software Implementation
8. RAD Software process model stands for _____ .
9. What is the simplest model of software development paradigm?
 - (i) Spiral model
 - (ii) Big Bang model
 - (iii) V-model
 - (iv) Waterfall model
10. Which model is also known as Verification and validation model?
11. What is Agile Manifesto?
12. What is the difference between waterfall and agile methods?
13. What are drawbacks of pair programming?
14. In how many parts scrum event is divided?
15. How does 'project risk' factor affect the spiral model of software development?
16. What do you mean by Risk analysis?
17. What are functional and non-functional requirements?
18. What is Push/Pull message in DCVS?
19. When the developer send commit message then what happens to work copy or centralised copy of project?
20. Explain Git and its features.
21. Draw a use-case of Hospital management system.
22. Draw a use-case of Bank ATM.
23. What are the situations where spiral model is used for software development?
24. Identify actors, use cases and relationship in the following use case diagram.



25 Identify actors, use-case and relationships in the following diagram.



26 Suppose we want to develop software for an alarm clock. The clock shows the time of day. Using buttons, the user can set the hours and minutes fields individually, and choose between 12 and 24-hour display. It is possible to set one or two alarms. When an alarm fires, it will sound some noise. The user can turn it off, or choose to 'snooze'. If the user does not respond at all, the alarm will turn off itself after 2 minutes. 'Snoozing' means to turn off the sound, but the alarm will fire again after some minutes of delay. This 'snoozing time' is pre-adjustable.

Identify the top-level functional requirement for the clock, and model it with a use case diagram.

27 Describe what happens in the sprint planning meeting.

28 What is the role of the Scrum Master?

29 Is there a difference between Agile and Scrum?

30 What should a Development Team do during a Sprint Planning meeting when they have realized that they have selected more than the items they can complete in a Sprint?

31 Which of the following is delivered at the end of the Sprint?

Answers:

1 mark questions

1. SRS contains all the requirements and specifications defined by customer, so it is very useful in development of software.
2. Software Requirement Specification.
3. Giving the software release with new features in next version is known as new increment.
4. In Verification it is checked that “are we building the system right”.
5. In Validation it is validated that “did we build the right system”.
6. After integrating all the modules in units and merging units to make the entire system, it is checked against desired functional and non-functional requirements by giving some test cases this is known as system testing.
7. (iv) Algorithms for Software Implementation
8. Rapid Application Development
9. Waterfall model
10. V-model
- 11 (i) INDIVIDUALS AND INTERACTIONS
(ii) WORKING SOFTWARE
(iii) CUSTOMER COLLABORATION
(iv) RESPONDING TO CHANGE

- 12 Waterfall is a structured software development methodology so in this entire project will be delivered after completing all the phases. Agile methodology is a practice that helps continuous iteration of development and testing in the software development process.

- 13 Drawbacks of Pair programming:
 - (i) Different skill set may kill the project.
 - (ii) Disagreement may occur between programmers.
 - (iii) Absence of partners.

- 14 Scrum event has four parts:
Sprint, Daily Scrum, Sprint Review, Sprint Retrospective.

- 15 The projects with many unknown risks that occur as the development proceeds, in that case, Spiral Model is the best development model to follow due to the risk analysis and risk handling at every phase.

- 16 Risk analysis: Risk analysis is a technique used to identify and assess factors that may jeopardize the success of a project or achieving a goal.

- 17 A functional requirement describes what a software system should do, while non-functional requirements place constraints on how the system will do so.

- 18 Programmers can update their local repositories with new data from the central server by an operation called “pull” and affect changes to the main repository by an operation called “push” from their local repository.
- 19 After commit message the changes made by programmers are kept permanent to the central repository copy of the project.
- 20 Git is a Distributed Version Control tool that supports distributed non-linear workflows by providing data assurance for developing quality software.

Features of Git:

Free and open source: It is freely available to download and also you can modify the source code of it.

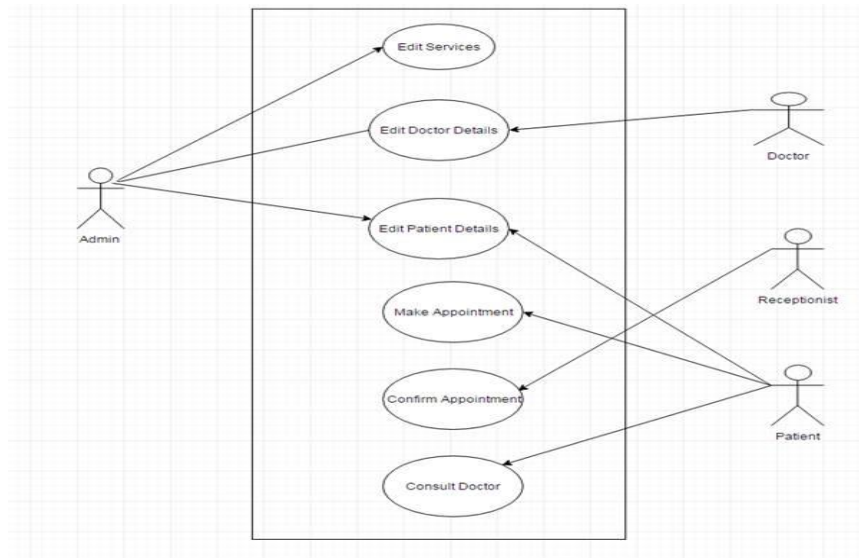
Automatic Backup of the Whole Repository: In case of loss of repository, it can be recovered from other workstations too.

Maintain full history of the changes: When pull operation is performed, developer gets all the previous edit history.

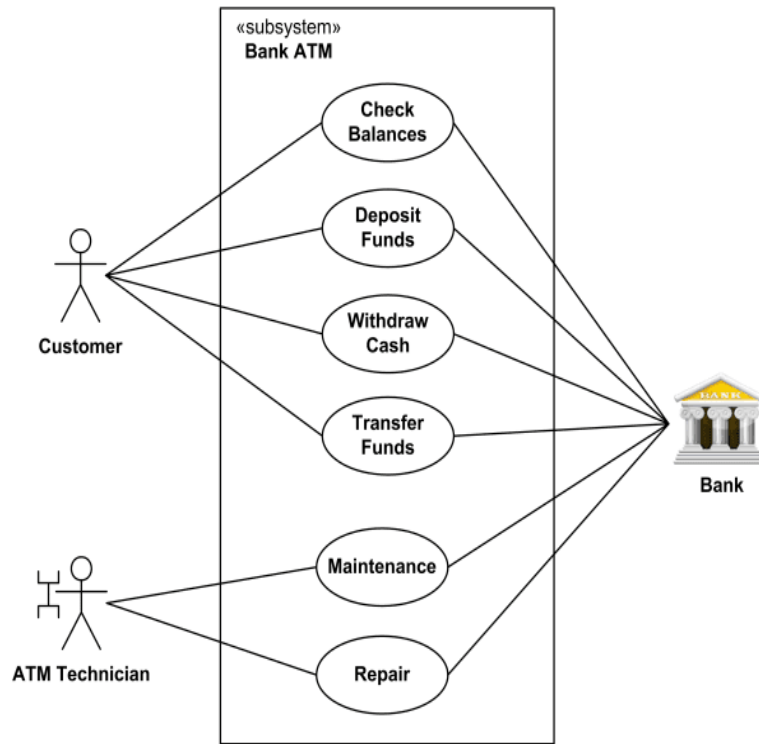
Allow offline Repo access: Developer can work with its repository offline.

Efficient Algorithm: Git provides best algorithms for branching and merging and all the operations to work smoothly.

21 Hospital Management System



22 Use-case of Bank ATM



23 Situations to use Spiral Methodology in Software development

- (i) When project is large.
- (ii) When releases are required to be frequent.
- (iii) When creation of a prototype is applicable.
- (iv) When risk and costs evaluation is important.
- (v) For medium to high-risk projects.
- (vi) When requirements are unclear and complex.
- (vii) When changes may require at any time.

24 Actors: Waiter, Customer and Cashier

Use cases: Order food, Eat food and Pay for food

Description of use cases and relationships:

- (i) Order food use case-
 Type- Standard use case
 Linked use cases: None
 Actors involved: Waiter and Customer
 Main Flow: The use case is activated by Waiter and Customer.
- (ii) Eat food use case-
 Type- Standard use case
 Linked use cases: None
 Actors involved: Customer
 Main Flow: The use case is activated by Customer.
- (iii) Pay for food use case-
 Type- Standard use case

Linked use cases: None

Actors involved: Cashier and Customer

Main Flow: The use case is activated by Cashier and Customer.

25 Actors: Cellular network and User

Use cases: Place phone call, receive phone call, use scheduler, place conference call and receive additional call

Relationship:

Place phone call <<extends>> Place conference call

Receive phone call <<extends>> Receive additional call

Details of Use-cases:

(i) Place Phone call-

Type- Standard use case

Linked use cases: Place conference call (extension use case)

Actors involved: Cellular network and user

Main flow:

(a) The use case is activated by user and cellular network.

(b) This use case can activate the place conference call use case.

(ii) Receive phone call-

Type- Standard use case

Linked use cases: receive additional call (extension use case)

Actors involved: Cellular network and user

Main flow:

(a) The use case is activated by user and cellular network.

(b) This use case can activate receive additional call use case.

(iii) Use scheduler-

Type- Standard use case

Linked use cases: None

Actors involved: user

Main flow: The use case is activated by user.

(iv) Place conference call-

Type- Extension use case

Actors involved: user, cellular network

Main flow: The use case is activated by Place phone call(not always).

Return to 'Place phone call' main flow.

(v) Receive additional call-

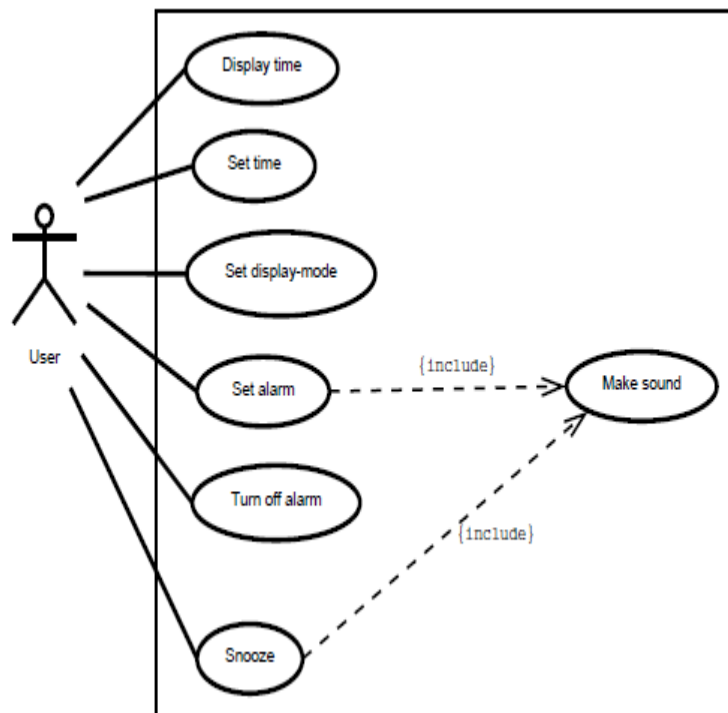
Type- Extension use case

Actors involved: user, cellular network

Main flow: The use case is activated by Receive Phone call(not always).

Return to 'Receive phone call' main flow.

26. Alarm Management System:



27. In Sprint Planning, the Product Owner presents the goal of the sprint and discusses the high priority product backlog items. The Delivery team then chooses the amount of work for the next sprint.

28. Here's how to handle a Scrum Master interview question like this: The Scrum Master serves the team and shields them from any distractions that could prevent them from completing a sprint goal. They also remove blocks, teach the team to become self-organized and serve as a coach who teaches Agile and Scrum values and principles.

29. Yes! Agile is the broader umbrella which Scrum falls under. Agile has four main values and twelve principles. Scrum has its own set of values and principles and provides a lightweight "framework" to help teams become Agile.

30. Inform the Product owner or Take a call to remove some of the sprint backlog items

Reason As we are still in the Sprint Planning meeting i.e. haven't started the Sprint yet, the developers are free to make changes to the Sprint Backlog items. They can choose to remove some of the items which they think that cannot be completed with the current Development Team's capacity.

Note that addition or removal should always be done in consensus with the Product Owner as he is the one who decides on the Priority of these items. The removal is not allowed once the Sprint has started.

31. An increment of Done software Reasoning

The output of every Sprint is an Increment of a Done Software which can be shipped off to the end user for usage. An item is only marked done if it matches the definition of done.

Topic : MySQL : Revision Tour, More on SQL

Q1 What is DBMS? What is the function of database management system ?

Q2 What is Data Model? Name various types of Data Model?

Q3 What is data redundancy? What are the problems associated with it?

Q4 Illustrate the difference between the three levels of data abstraction.

Q5 What is meant by “data independence”? What are types of Data Independence?

Q6. What is SQL?

Q7. Define various Relational Model Terminology

1. Relation 2. Tuple 3. Attribute 4. Degree 5.

Cardinality

6. Primary Key 7. Candidate Key 8. Alternate Key 9. Foreign Key

Q8 What are various Integrity Constraints? Describe them?

Q9 How are SQL Statements Classified?

Q10. Create the following table

DEPT TABLE

Column Name	Type	SIZE	Constraint	Description
DEPTNO	INTEGER		PRIMARY KEY	DEPARTMENT NUMBER
DNAME	VARCHAR	20		NAME OF DEPARTMENT
LOC	VARCHAR	10		LOCATION OF DEPARTMENT

EMP TABLE

Column Name	Type	SIZE	Constraint	Description
EMPNO	INTEGER		PRIMARY KEY	EMPLOYEE NUMBER
ENAME	VARCHAR	20	NOT NULL	EMPLOYEE NAME
JOB	CHAR	10		DESIGNATION
MGR	INTEGER			RESPECTIVE MANGER'S EMPNO
HIREDATE	DATE			DATE OF JOINING
SAL	DECIMAL	9,2	>0	SALARY
COMM	INTEGER			COMMISSION

DEPTNO	INTEGER		FOREIGN KEY DEPT DEPTNO	DEPARTMENT NUMBER
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Q11 On the basis of above table perform the following queries

- a) List the employee belonging to the department 20 and working as salesman
- b) List the employee number and name of managers.
- c) List the name of clerks working in department 20
- d) List the details of the employees who have joined before the end of September 2014
- e) List the names of employees who are not managers.
- f) List the name of employees whose employee numbers are 7369,7521,7839,7934,7788
- g) List the employee name and salary whose salary is between 1000 and 2000.
- h) List the employee name who have joined before 30 June 2014 and after Dec 2014
- i) List the different job available in the emp table
- j) List the employee who are not eligible for commission.
- k) List the employee whose name start with "S"
- l) List the name of employee whose name has 5 characters.
- m) List the name of employee having 'l' as second character.
- n) List the empno, name and salary in ascending order of salary.
- o) List the employee name and hiredate in descending order of hiredate.
- p) List the employee name, salary, pf, hra, da and gross; order the result in ascending order of gross. Pf is 10% of salary, HRA is 50% of salary and da is 30% of salary.
- q) List the number of employees working in emp table.
- r) List the number of jobs available in emp table.
- s) List the department number and the total salary payable in each department.
- t) List the job and the number of employees in each job. The result should be in descending order of the number of employees.
- u) List the total salary, maximum and minimum salary and the average salary of employees jobwise for department number 20 only.
- v) List the average monthly salary for each job type within department.
- w) List the average salary for all department employing more than 5 people.

- x) List the total salary, maximum and minimum salary and the average salary of employee job wise for department number 20 and display only those rows having average salary greater than 1000 in ascending order of sum(sal).
- y) List the employee number, name and department number and department name of clerks.
- z) Display the total salary which is sum of salary and commission.
- aa) Add a column address to the employee table
- bb) Suppose the user forget to make empno as primary key and deptno as foreign key write the query to make such changes.
- cc) Increase the size of salary from 9,2 to 15,2
- dd) Drop the column address in the above table;

Q 12 Amit creates a database name contacts but he is not able to create the table. What command should be used before creating the table?

Q13 A table Student has 4 rows and 2 Column and another table has 3 rows and 4 columns. How many rows and columns will be there if we obtain the Cartesian product of these two tables?

Q14 Mr. Sanghi created two tables with City as Primary Key in Table1 and Foreign key in Table2 while inserting row in Table2 Mr Sanghi is not able to enter value in the column City. What is the possible reason for it?

Q15. What is difference between curdate() and date() functions?

Q16. There is column salary in table employee. The following two statements are giving different outputs. What may be the possible reasons?

Select count(*) from employee select count(salary) from employee

Q17. Give One difference between Rollback and Commit?

Q18. What is View?

Q19. TABLE: GRADUATE

S.NO	NAME	STIPEND	SUBJECT	AVERAGE	DIV.
1	KARAN	400	PHYSICS	68	I
2	DIWAKAR	450	COMP. Sc.	68	I
3	DIVYA	300	CHEMISTRY	62	I

4	REKHA	350	PHYSICS	63	I
5	ARJUN	500	MATHS	70	I
6	SABINA	400	CEHMISTRY	55	II
7	JOHN	250	PHYSICS	64	I
8	ROBERT	450	MATHS	68	I
9	RUBINA	500	COMP. Sc.	62	I
10	VIKAS	400	MATHS	57	II

- (a) List the names of those students who have obtained DIV I sorted by NAME.
- (b) Display a report, listing NAME, STIPEND, SUBJECT and amount of stipend received in a year assuming that the STIPEND is paid every month.
- (c.) To count the number of students who are either PHYSICS or COMPUTER SC graduates.
- (d) To insert a new row in the GRADUATE table 11,"KAJOL", 300, "COMP. SC.", 75, 1
- (e) Give the output of following sql statement based on table GRADUATE:
- Select MIN(AVERAGE) from GRADUATE where SUBJECT="PHYSICS";
 - Select SUM(STIPEND) from GRADUATE WHERE div=2;
 - Select AVG(STIPEND) from GRADUATE where AVERAGE>=65;
 - Select COUNT(distinct SUBJECT) from GRADUATE;

Assume that there is one more table GUIDE in the database as shown below:

Table: GUIDE

MAINAREA	ADVISOR
PHYSICS	VINOD
COMPUTER SC	ALOK
CHEMISTRY	RAJAN
MATHEMATICS	MAHESH

- (f) What will be the output of the following query:
SELECT NAME, ADVISOR FROM GRADUATE, GUIDE WHERE SUBJECT= MAINAREA;

Q20. Write the SQL query commands based on following table

Table : Book

Book_id	Book name	Author_name	Publisher	Price	Type	Quantity
C0001	Fast Cook	Lata Kapoor	EPB	355	Cookery	5

F0001	The Tears	William Hopkins	First Publi.	650	Fiction	20
T0001	My First c++	Brain & Brooke	FPB	350	Text	10
T0002	C++ Brain works	A.W. Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Anna Roberts	First Publ.	750	Fiction	50

Table : issued

Book_Id	Quantity Issued
T0001	4
C0001	5
F0001	2

Write SQL query for (a) to (f)

- To show book name, Author name and price of books of First Pub. Publisher
- To list the names from books of text type
- To Display the names and price from books in ascending order of their prices.
- To increase the price of all books of EPB publishers by 50.
- To display the Book_Id, Book_name and quantity issued for all books which have been issued
- To insert a new row in the table issued having the following data. 'F0003', 1
- Give the output of the following
 - Select Count(*) from Books
 - Select Max(Price) from books where quantity >=15
 - Select book_name, author_name from books where publishers='first publ.'
 - Select count(distinct publishers) from books where Price>=400

Q21. Write the SQL commands for the (i) to (iv) and write the output of the (v) to (viii) on the basis of table CLUB. Table: CLUB

COACH_ID	COACHNA	AGE	SPORTS	DATOFAPP	PAY	SEX
	ME					
1	KUKREJA	35	KARATE	27/03/1996	10000	M
2	RAVINA	34	KARATE	20/01/1997	12000	F
3	KARAN	34	SQUASH	19/02/1998	20000	M
4	TARUN	33	BASKETBALL	01/01/1998	15000	M
5	ZUBIN	36	SWIMMING	12/01/1998	7500	M
6	KETAKI	36	SWIMMING	24/02/1998	8000	F

7	ANKITA	39	SQUASH	20/02/1998	22000	F
8	ZAREEN	37	KARATE	22/02/1998	11000	F
9	KUSH	41	SWIMMING	13/01/1998	9000	M
10	SHAILYA	37	BASKETBALL	19/02/1998	17000	M

- a. To show all information about the swimming coaches in the club.
- b. To list names of all coaches with their date of appointment (DATOFAPP) in descending order.
- c. To display a report, showing coachname, pay, age and bonus (15% of pay) for all the coaches.
- d. To count the number of coaches in each sports.
- e. Give the output of following SQL statements:
 - I. SELECT COUNT(DISTINCT SPORTS) FROM CLUB;
 - II. SELECT SUM(PAY) FROM CLUB WHERE DATOFAPP> '31/01/1998';
 - III. SELECT LCASE(SPORTS) FROM CLUB;
 - IV. SELECT MOD(AGE,5) FROM CLUB WHERE SEX= 'F';

Q22 . Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables.

Table: ACCOUNT

ANO	ANAME	ADDRESS
101	Nirja Singh	Bangalore
102	Rohan Gupta	Chennai
103	Ali Reza	Hyderabad
104	Rishabh Jain	Chennai
105	Simran Kaur	Chandigarh

Table: TRANSACT

TRNO	ANO	AMOUNT	TYPE	DOT
T001	101	2500	Withdraw	2017-12-21

T002	103	3000	Deposit	2017-06-01
T003	102	2000	Withdraw	2017-05-12
T004	103	1000	Deposit	2017-10-22
T005	101	12000	Deposit	2017-11-06

- (i) To display details of all transactions of TYPE Deposit from Table TRANSACT
- (ii) To display the ANO and AMOUNT of all Deposits and Withdrawals done in the month of October 2017 from table TRANSACT.
- (iii) To display the last date of transaction (DOT) from the table TRANSACT for the Accounts having ANO as 103.
- (iv) To display all ANO, ANAME and DOT of those persons from tables ACCOUNT and TRANSACT who have done transactions less than or equal to 3000.
- (v) SELECT ANO, ANAME FROM ACCOUNT WHERE ADDRESS NOT IN ('CHENNAI', 'BANGALORE');
- (vi) SELECT DISTINCT ANO FROM TRANSACT;
- (vii) SELECT ANO, COUNT(*), MIN(AMOUNT) FROM TRANSACT GROUP BY ANO HAVING COUNT(*) > 1;
- (viii) SELECT COUNT(*), SUM(AMOUNT) FROM TRANSACT WHERE DOT <= '2017-06-01';
- (ix) identify the foreign key.

Q23. What are indexes

SOLUTIONS

Ans 1. A database management system (DBMS) is system software for creating and managing [databases](#). The DBMS provides users and programmers with a systematic way to create, retrieve, update and manage [data](#)

Ans 2. A data model refers to a set of concepts to describe the structure of a database, and certain constraints (restrictions) that the database should obey. The four data model that are used for database management are :

1. Relational data model : In this data model, the data is organized into tables (i.e. rows and columns). These tables are called relations.
2. Hierarchical data model
3. Network data model
4. Object Oriented data model

Ans 3. Data redundancy means duplication of data. It causes duplicate data at different locations which destroys the integrity of the database and wastage of storage space.

Ans 4.

Internal Level	Conceptual Level	External Level
Describes how the data is actually stored on the storage medium.	Describes what data are actually stored in the database and relationship existing among data.	Concerned with the data is viewed by individual users.
At this level, complex low-level data structure are described in details.	At this level, the database is described logically in terms of simple data-structures.	Only a part of the database relevant to the users is provided to them through this

Ans 5. Data independence is the ability to modify a scheme definition in one level without affecting a scheme definition in a higher level. Data independence types are

1. Physical Data Independence has ability to modify the scheme followed at the physical level without affecting the scheme followed at the conceptual level.
2. Logical Data Independence has ability to modify the conceptual scheme without causing any changes in the schemes followed at view levels.

Ans 6. SQL is a language that enables you to create and operate on relational databases, which are sets of related information stored in tables.

Ans 7

1. Relation : A table storing logically related data is called a Relation.
2. Tuple : A row of a relation is generally referred to as a tuple.
3. Attribute : A column of a relation is generally referred to as an attribute.
4. Degree : This refers to the number of attributes in a relation.
5. Cardinality : This refers to the number of tuples in a relation.

- 6. Primary Key : This refers to a set of one or more attributes that can uniquely identify tuples within the relation.
- 7. Candidate Key : All attribute combinations inside a relation that can serve as primary key are candidate keys as these are candidates for primary key position.
- 8. Alternate Key : A candidate key that is not primary key, is called an alternate key.
- 9. Foreign Key : A non-key attribute, whose values are derived from the primary key of some other table, is known as foreign key in its current table.

Ans 8. Integrity Constraints

Integrity constraints are a set of rules. It is used to maintain the quality of information.

Integrity constraints ensure that the data insertion, updating, and other processes have to be performed in such a way that data integrity is not affected.

Thus, integrity constraint is used to guard against accidental damage to the database.

Types of Integrity Constraint

1. Domain constraints

Domain constraints can be defined as the definition of a valid set of values for an attribute. The data type of domain includes string, character, integer, time, date, currency, etc. The value of the attribute must be available in the corresponding domain.

Example:

ID	NAME	SEMENSTER	AGE
1000	Tom	1 st	17
1001	Johnson	2 nd	24
1002	Leonardo	5 th	21
1003	Kate	3 rd	19
1004	Morgan	8 th	A

Not allowed. Because AGE is an integer attribute

2. Entity integrity constraints

The entity integrity constraint states that primary key value can't be null.

This is because the primary key value is used to identify individual rows in relation and if the primary key has a null value, then we can't identify those rows.

A table can contain a null value other than the primary key field.

Example:

EMPLOYEE

EMP_ID	EMP_NAME	SALARY
123	Jack	30000
142	Harry	60000
164	John	20000
	Jackson	27000

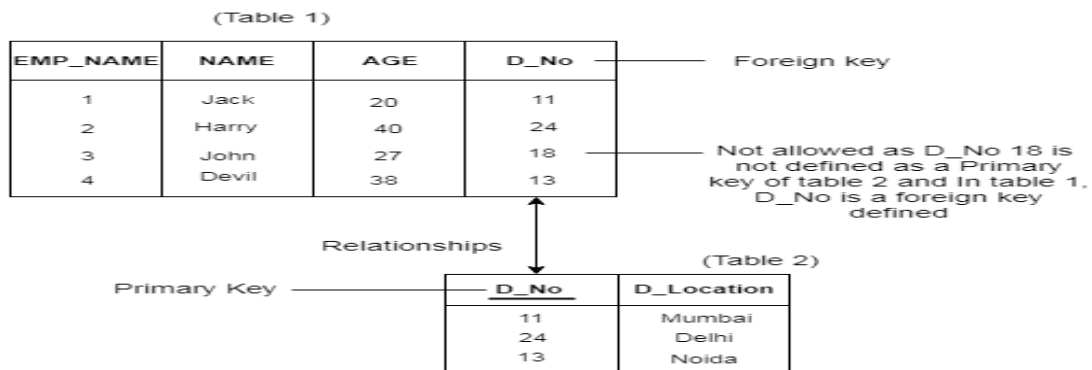
Not allowed as primary key can't contain a NULL value

3. Referential Integrity Constraints

A referential integrity constraint is specified between two tables.

In the Referential integrity constraints, if a foreign key in Table 1 refers to the Primary Key of Table 2, then every value of the Foreign Key in Table 1 must be null or be available in Table 2.

Example:



4. Key constraints

Keys are the entity set that is used to identify an entity within its entity set uniquely.

An entity set can have multiple keys, but out of which one key will be the primary key. A primary key can contain a unique and null value in the relational table.

Example:

ID	NAME	SEMENSTER	AGE
1000	Tom	1 st	17
1001	Johnson	2 nd	24
1002	Leonardo	5 th	21
1003	Kate	3 rd	19
1002	Morgan	8 th	22

Not allowed. Because all row must be unique

Ans 9. Classification of Sql Statements

- a. DDL(Data Definition Language): It is set of SQL commands used to create, modify and delete database structures but not data. Commands in DDL are
1. Create – to create the objects in database
 2. Alter – alters the structures of the database
 3. Drop – Delete objects from the database
- b. DML(Data Manipulation Language): It is the area of SQL that allows changing the data within the database. Commands in DML are
1. insert : insert data into the table
 2. Update Updates Existing data within the table
 3. Delete : Delete the records from the table
- c. TCL(Transaction Control Language): Commands that allow to manage and control the transactions Commands are
1. Commit : making changes to database permanent
 2. Rollback : undoing changes to database permanent
 3. SavePoint : Identify a point in a transaction to which we can later roll back
 - 4 SET TRANSACTION : Change transaction option like what roll back segment to use

Ans 10 .

Create table dept(deptno integer Primary Key, dname integer(20), loc varchar(10));
 Create table emp(empno integer Primary Key, Ename varchar(20) NOT NULL, job Char(10), mgr integer, hiredate date, sal decimal(9,2) check(sal>0), comm integer, deptno integer references dept(deptno) on delete cascade);

Ans 11.

- a) select * from emp where deptno=20 or job='salesman';
- b) select empno,ename from emp where job='Manger';
- c) select * from emp where deptno=20 and job='clerk';
- d) select * from emp where hiredate<'2014-09-01';
- e) select * from emp where job!='manager';
- f) select * from emp where empno in(7369,7521,7839,7934,7788);
- g) select empno, ename from emp where empno between 1000 and 2000;
- h) select ename from emp where hiredate not between '2014-06-30' and '2014-12-31';

- i) select distinct(job) from emp;
- j) select * from emp where comm is NULL;
- k) select ename from emp where ename like 'S%';
- l) select ename from emp where ename like '_____';
- m) select ename from emp where ename like '_l%';
- n) select empno,ename,sal from emp order by sal;
- o) select empno,ename from emp order by hiredate desc;
- p) select ename, sal,sal*.5 as "hra",sal*.1 as "pf", sal*.3 as "da", sal+sal*.5+sal*.3-sal*.1 as "gross" order by sal+sal*.5+sal*.3-sal*.1;
- q) select count(*) from emp ;
- r) select count(distinct job) from emp;
- s) select deptno,sum(sal) from emp group by deptno;
- t) select job, count(*) from emp group by job order by count(*) desc;
- u) select sum(sal),max(sal),min(sal),avg(sal) from where deptno=20 emp group by job;
- v) select deptno,job,deptno from emp group by deptno,job;
- w) select avg(sal) from emp group by deptno having count(*)>5;
- x) select sum(sal),max(sal),min(sal),avg(sal) from emp where deptno=20 group by job having avg(sal)>1000 order by sum(sal);
- y) select empno,ename, e.deptno,dname from emp e, dept d where e.deptno=d.deptno;
- z) select empno,ename, sal, sal+ifnull(comm,0) as "total salary" from emp;
- aa) alter table emp add column address varchar(20);
- bb) alter table emp add constraing pk_1 Primay key(empno);
- cc) alter table emp add constraint fk_1 Foreign Key deptno references (dept(deptno) on delete cascade)
- dd) alter table emp Modify sal decimal(15,2);
- ee) alter table emp drop column address;

Ans 12

Use Contacts

Ans 13

12 rows and 6 columns

Ans 14

Mr Sanghi was trying to enter the name of City in Table2 which is not present in Table1 i.e. Referential Integrity ensures that value must exist in referred table.

Ans 15

curdate() returns the current date whereas date() extracts the date part of a date.

Ans 16

The possible reason is that the salary filed may contain null values so count(salary) will not count that record.

Ans 17

Rollback command is used to end the current transaction and Undo all the changes we made since current transaction begin While Commit is used to make all changes permanent to underlying database which we made during the current transaction.

Ans 18

View is a virtual table that does not exist physically. Data in view is derived from original table .

```
create view v1 as select empno,ename from emp where deptno=10;
```

Ans 19

- (a) SELECT NAME FROM GRADUATE WHERE DIV='I' ORDER BY NAME;
- (b) SELECT NAME, STIPEND, SUBJECT, STIPEND*12 STIPEND_YEAR FROM GRADUATE;
- (c) SELECT SUBJECT, COUNT(NAME) FROM GRADUATE GROUPBY (SUBJECT) HAVING SUBJECT='PHYSICS' OR SUBJECT='COMP. Sc.';
- (d) INSERT INTO GRADUATE VALUES(11,'KAJOL',300,'COMP. Sc.',75,1);
- (e) (i) MIN(AVERAGE) 63
- (ii) SUM(STIPEND) 800
- (iii) AVG(STIPEND) 420
- (iv) COUNT(DISTINCTSUBJECT) 4
- (f) SELECT NAME, ADVISOR FROM GRADUATE, GUIDE WHERE SUBJECT=MAINAREA;

NAME	ADVISOR
DIVYA	RAJAN
SABINA	RAJAN
KARAN	VINOD
REKHA	VINOD
JOHN	VINOD

Ans 20

- a) Select book_name, author_name , price from books where publisher='First Publ'
- b) Select book_name from books where type='Text'
- c) Select book_name, price from books Order by Price;
- d) Update books set price=price+50 where publishers='EPB'
- e) Select a.book_id,a.book_name,b.quantity_issued from books a, issued b where a.book_id=b.book_id
- f) Insert into issued Values ('F0003',1);
- g) (i) 5 (ii) 750 (iii)Fast Cook Lata Kappor (iv)My First c++ Brain & Brooke

Ans 21

- i.SELECT * FROM CLUB WHERE SPORTS='SWIMMING';
- ii. SELECT COACHNAME,DATOFAPP FROM CLUB ORDER BY DATOFAPP DESC;
- iii. SELECT COACHNAME, PAY, AGE, PAY *0.15 AS BONUS FROM CLUB ;
- iv. SELECT COUNT(COACHNAME) FROM CLUB GROUP BY SPORTS
- v.(a) 4
- (b). 78000

(c)

Karate
Karate
Squash
Basketball
Swimming
Swimming
Squash
Karate
Swimming
Basketball

(d) 4 6 9 7

Ans 22

(i) SELECT * FROM TRANSACT WHERE TYPE = 'Deposit';

(ii) SELECT ANO,AMOUNT FROM TRANSACT WHERE DOT >= '2017-10-01' AND DOT <= '2017-10-31'; OR

SELECT ANO,AMOUNT FROM TRANSACT WHERE DOT BETWEEN '2017-10-01' AND '2017-10-31';

(iii) SELECT MAX(DOT) FROM TRANSACT WHERE ANO = 103;

(iv) SELECT ACCOUNT.ANO,ANAME,DOT FROM ACCOUNT,TRANSACT WHERE

ACCOUNT.ANO=TRANSACT.ANO AND AMOUNT <=3000; OR

SELECT A.ANO,ANAME,DOT FROM ACCOUNT A,TRANSACT T WHERE A.ANO=T.ANO AND AMOUNT <=3000;

(v) ANO ANAME

103 Ali Reza

105 Simran Kaur

(vi) DISTINCT ANO

101

102

103

(vii) ANO COUNT(*) MIN(AMOUNT)

101	2	2500
-----	---	------

103	2	1000
-----	---	------

(viii) COUNT(*) SUM(AMOUNT)

2	5000
---	------

(ix) Ano in Transact table

Ans 23. An index is a data structure maintained by database that helps it find records within a table more quickly. Eg. To create index : create index id on emp(deptno);

CREATION OF DJANGO BASED WEB APPLICATION

1. What is Django?
2. What is the default URL of your Django project when you run it on builtin server?
- 3 What is the default port used by built in web server of Django?
- 4 What is the Django shortcut method to render an html response?
5. Differentiate between Django GET and POST method.
6. What are the features of Django?
7. What is the history of Django framework?
8. what is MVC?
9. What is MTV pattern of Django Architecture?
10. Write a program to perform read and write operation with .csv file.
- 11 Explain the importance of settings.py file and what data/ settings it contains.
- 12 Write the following commands for Django Project
 - i)To create a project name XYZ company
 - ii)to run the server of Django for XYZ companyen
 - iii) to create an app name employee
 - iv)write command to set the virtual environment
- 13 Mr Rajesh create a project name ABC in Django framework and an app in this project name friendchat but he forgot to register the app .Help Mr rajesh to register the app Friendchat with the project name ABC
- 14 Mr Karan created a project name “PQR” in Django. Name the file which is automatically created on creation of project PQR
- 15 Mrs Neelam create an app Friendbook inside the Django project folder name Messenger .Name the files which is created inside app friendbook automatically

Answers

1 . Django s a free and open source web application framework, written in Python. A web framework is a set of components that helps you to develop websites faster and easier.

2 . <http://127.0.0.1:8000>

3. 8000

4. Render_to_response

5 . GET and POST. GET and POST are the only HTTP methods to use when dealing with forms. Django's login form is returned using the POST method, in which the browser bundles up the form data, encodes it for transmission, sends it to the server, and then receives back its response.

Both of these are dictionary-like objects that give you access to GET and POST data. POST data generally is submitted from an HTML <form> , while GET data can come from a <form>Top of Form Top of Form or the query string in the page's URL.

6

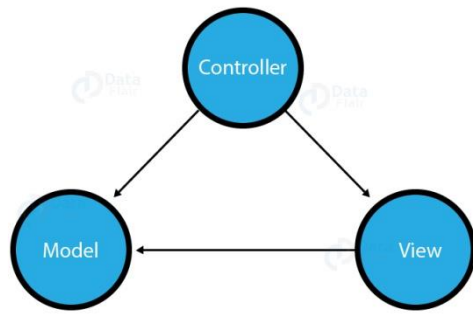
- I. Excellent Documentation
- II. Python Web-framework
- III. SEO optimized
- IV. High scalability
- V. versatile in nature
- VI. offers high security
- VII. Thoroughly tested
- VIII. provides rapid development

7 . Django was created by two web developers Adrian Holovaty and Simon Willison working at the Lawrence Journal-World Newspaper in 2003. It was released publicly as a BSD license in July 2005. The framework was named after guitarist Django Reinhardt.

The main reason behind Django's existence is that Django inherited Python's "batteries-included" approach and includes pre-made modules and applications for common tasks in web development like user authentication, templates, routes, and views, admin interface, robust security and support for multiple database backends.

8 . It is an acronym for Model View Controller. MVC pattern is a Product Development Architecture. It solves the traditional approach's drawback of code in one file, i.e., that MVC architecture has different files for different aspects of our web application/ website.

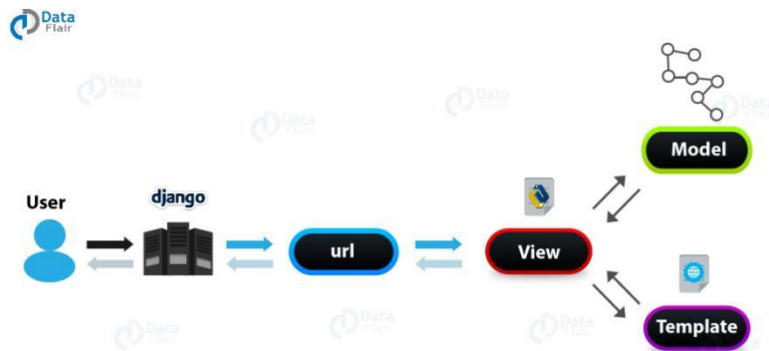
The MVC pattern has three components, namely Model, View, and Controller.



1. Model

The Model is the part of the web-app which acts as a mediator between the website interface and the database. In technical terms, it is the object which implements the logic for the application's data domain. There are times when the application may only take data in a particular dataset, and directly send it to the view (UI component) without needing any database then the dataset is considered as a model.

Although today if we want any kind of website we need to have some sort of database as we must be requiring some user input even if we are creating a simple blog site.



2. View

This component contains the UI logic in the Django architecture.

View is actually the User Interface of the web-application and contains the parts like HTML, CSS and other frontend technologies. Generally, this UI creates from the Models component, i.e., the content comes from the Models component.

3. Controller

The controller as the name suggests is the main control component. What that means is, the controller handles the user interaction and selects a view according to the model.

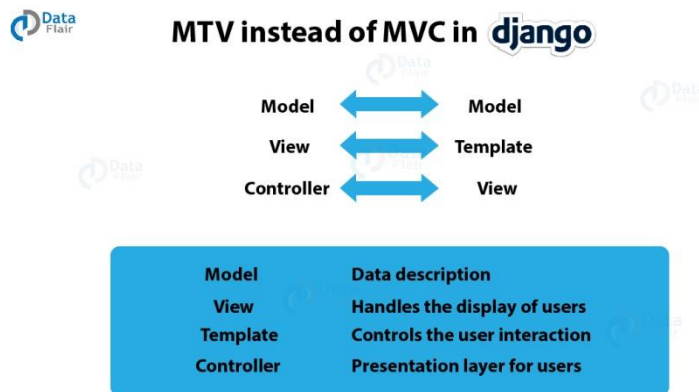
The main task of the controller is to select a view component according to the user interaction and also applying the model component.

This architecture has lots of advantages and that's why Django is also based on this architecture. It takes the same model to an advanced level.

9 . Django is mainly an MTV (Model-Template-View) framework. It uses the terminology Templates for Views and Views for Controller.

Template relates to the View in the MVC pattern as it refers to the presentation layer that manages the presentation logic in the framework and essentially controls the content to display and how to display it for the user.

Thus our Python code will be in views and models and HTML code will be in templates.

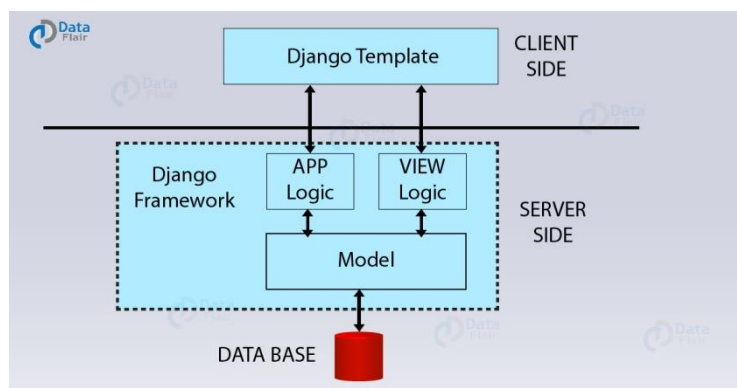


In MTV, the definitions of Model still remain the same that is, the Model contains the logical file structure of the project and is the middleware & data handler between database and view. The Model provides a definition of how the data formats as coming from the view so, it stores in the database and vice-versa, i.e., the retrieving information from the database transfers to the view in the displayable format.

The View in MTV architecture can look like the controller, but it's not. The View in this MTV architecture is formatting the data via the model. In turn, it communicates to the database and that data which transfer to the template for viewing.

The template is making the life of a frontend developer easy that's for sure. It also provides more development speed then the traditional MVC architecture would.

Template's main goal is to keep everything that browser renders. The model's data that's coming from the server in different parts while integrating the same when the user interacts with the website. Here, the template layer in Django is more similar to the views layer in MVC pattern. This layer is more focused and with Django framework, it provides much more extendibility to the frontend developers than what MVC architecture was giving.



```

10.
import csv
def readcsv():
    with open('C:\\Users\\ViNi\\Downloads\\data.csv','rt')as f:
        data = csv.reader(f) #reader function to generate a reader object
        for row in data:
            print(row)
def writecsv( ):
    with open('C:\\Users\\ViNi\\Downloads\\data.csv', mode='a', newline='') as file:
        writer = csv.writer(file, delimiter=',', quotechar='"') #write new record in file
        writer.writerow(['4', 'Devansh', 'Arts', '404'])
print("Press-1 to Read Data and Press-2 to Write data: ")
a=int(input())
if a==1:
    readcsv()
elif a==2:
    writecsv()
else:
    print("Invalid value")

```

11 .When Django server starts, it first looks for settings.py. As the name settings, it is the main settings file of your web application. Everything inside your Django project like databases, backend engines, middlewares, installed applications, main URL configurations, static file addresses, templating engines, allowed hosts and servers and security key stores in this file as a list or dictionary.

So, when your Django server starts it executes settings.py file and then loads particular engines and databases so that when a request is given it can serve the same quickly.

12 .

i)django-admin start project XYZ

ii)python manage.py runserver

iii)python manage.py startapp employee

iv)virtualenv <projectname>

13 .we add the name of app Friendchat with the INSTALLED_APPS sections of the file name settings.py

14 . init_.py,settings.py,urls.py,wsgi.py

15. init_.py,admin.py,apps.py,models.py,test.py,views.py

INTERFACE PYTHON WITH SQL

- Q1. What is My44db?
- Q2. What is resultset?
- Q3. What is database cursor?
- Q4. What is database connectivity?
- Q5. Which function do use for executing a SQL query?
- Q6. Which package must be imported to create a database connectivity application?
- Q7. Differentiate between fetchone() and fetchall()
- Q8. How we can import MYSQL database in python?
- Q9. Write a query to rename the name of the artist from Towang to Tauwang.
- Q10. Write a query to delete an entity from the table Artists whose id is 1
- Q. 11 Write a small python program to insert a record in the table books with attributes (title ,isbn).
- Q. 12 Write a small python program to retrieve all record from the table books with attributes (title ,isbn).

ANSWER

1. MySQLdb is an open-source freely available relational database management system that uses Structured Query Language. Now one of the most important question here is "What is SQL?"

SQL (Structured Query Language) is a standard language for relational databases that allow users to do various operations on data like, Manipulating, Creating, Dropping, etc. In a nutshell, SQL allows you to do anything with the data.

2. Result set refers to a logical set of records that are fetched from the database by executing a query.

3. Database cursor is a special control structure that facilitates the row by row processing of records in the result set

4. Database connectivity refers to connection and communication between an application and a database system.

5. Cursor.execute(sql query)

6. Mysql.connector

7. fetchone() – It fetches the next row of a query result set. A result set is an object that is returned when a cursor object is used to query a table.

fetchall() – It fetches all the rows in a result set. If some rows have already been extracted from the result set, then it retrieves the remaining rows from the result set.

8. Use the mysql.connector.connect() method of MySQL Connector Python with required parameters to connect MySQL. Use the connection object returned by a connect() method to create a cursor object to perform Database Operations. The cursor.execute() to execute SQL queries from Python.

9.

```
updateSql = "UPDATE Artists SET NAME= 'Tauwang' WHERE ID = '1' ;"
```

```
cursor.execute(updateSql)
```

10. deleteSql = "DELETE FROM Artists WHERE ID = '1';"

```
cursor.execute(deleteSql)
```

11.

```
import mysql.connector as sqlator
```

```
conn = sqlator.connect(host="localhost",user="root",passwd="",database="test")
```

```
cursor=con.cursor()
```

```
query="INSERT into books(title,isbn) values('{{'}}'.format('Neelesh','5143')
```

```
cursor.execute(query)
```

```
con.close()
```

12.

```
import mysql.connector as Sqlator
conn =sqlator.connect(host="localhost",user="root",passwd="",database="test")
cursor=con.cursor()
query="select * from query"
cursor.execute(query)
data=cursor.fetchall()
for row in data:
    print(row)
conn.close()
```


SOCIETY, LAW AND ETHICS

- Q1. What do you mean by ethics? What is it necessary?
- Q2. What is Spam?
- Q3. what is Hacking?
- Q4. What do you know about computer viruses?
- Q5. Do computers have an impact in our daily lives. Give examples to support your argument.
- Q6. What do you understand by 'Intellectual Property Rights'?
- Q7. Name the types of intellectual property rights.
- Q8. Complete the following abbreviation: NASSCOM, HOLMES, DPA.
- Q9. What should a user had do to protect the database from being changed or misused by other internet users.
- Q10. What do you know about software copyright law?
- Q11. List the measure taken by an individual to protect his/her rights to privacy.
- Q12. What is the difference between Junk and Junk e-mails.
- Q13. What is spoofing?
- Q14. What do you understand by Malicious code?
- Q15. Name the types of malicious code?
- Q16. What is worm?
- Q17. What is Trojan?
- Q18. What is viruses?
- Q19. What a short note on Cyber Crime.
- Q20. The illegal use of computer system is sometimes known as computer related crimes. (i) Give three distinct examples of computer related crimes. (ii) Give three steps can be computers related crimes are:

Q21. Describe four separate measure that can be taken to prevent accidental or deliberate misuse of data on a stand- alone computer system.

Q22. What do you understand by Internal and External threats to a computer system.

Q23. Describes some Internal Threats to the system.

Q24. Mention some External Threats to the systems.

Q25. What do you understand by the word Privacy ? Why does many companies routinely monitor their purchase through the Internet.

Q26. What are software ethics?

Q27. What are individual's right to privacy?

Q28. What are intellectual property rights?

Q29. Explain in Brief "Software Piracy"?

Q30. Explain gender and disability issues while teaching and using computers.

Q31. What are the possible causes that contribute to gender and disability issues?

Q32. What is Biometrics?

Q33. How Does a Fingerprint Optical Scanner Work?

Q34. What do you understand by Employees Privacy and Cleanliness Concerns?

Q35. Name few top Advantages of Fingerprint Authentication

Answer

1 Ethics is the classical sense, refers to the rules and standards governing the conduct of an individual with others. In order to keep healthy environment in computer room, to make good relation co-workers and to improve the working efficiency some basic ethics are necessary.

2. Spam are unwanted e-mail which are business related and sent to the e-mail account in bulk.

3. Hacking is a technique by which some computers experts reach to any private or confidential area of the computer and steal information available on the computer.

4. Computer Viruses are generally developed with a definite intention to change computer files or cause inconvenience and annoyance to computer users.

5 .Yes. Computers prevail every aspect of modern life.

6 .Intellectual property rights are the rights given to people for the original creations of their minds. They usually give the creator an exclusive rights over the use of his/her creation for a certain period of time.

7 . The types of intellectual property protection rights are Copyright. Patents and Trademarks.

8. NASSCOM: National Association of Software and Service Companies. HOLMES: Home Office Large Major Enquiry System. DPA : Data Protection Act.

9. User should have to change his/her password very frequently.

10. Computer software is covered by the laws, which covers a wide range of intellectual property such as music, literature and software. The main provisions of the act is to make illegal to:(i) Copy software.(ii) Run pirated software.(iii) Transmit software over a telecommunication line, thereby creating a copy.

11 .(i) Avoid being added to mailing lists.(ii) Make online purchase only through secure websites.(iii) Never assume that your e-mail is private.(iv) Be careful when posting to newsgroups.(v) Do not make online argument.

12 Junk faxes: The unsolicited and unwanted messages receive from unnamed senders, are junk faxes. junk e-mails: The unwanted messages from various senders in an electronic mail box are junk e-mail.

13 Spoofing enables the junk e-mail to hide his or her identity from the recipient spoofing the sender places a false return address on the junk message.

14 Malicious code can be defined as “software which interferes with the normal operation of a computer system”

15 There are three types of malicious code: (i) Virus (ii) Worm (iii) Trojan.

16 A program which copies itself into nodes in a network, without permission is called a worm.

17 A program which masquerades as a legitimate program, but does something other than what was intended.

18 Viruses are generally developed with a definite intention to damage files or cause inconvenience and annoyance to computer users.

19 Cyber Crime: Cyber crime is that crime which is done through internet. The Cyber act 2000, was now enforced by Indian government to punish the cyber Criminals. The points of cyber act 2000 are as follows. (i) The documents transferred through internet are legally valid and can be produced in court of law. (ii) The digital signatures are described on Authentic documents. (iii) Cyber crime is defined and provision of giving punishment to the cyber criminals. (iv) A plan is made to investigate the cyber crime and to take action on the criminal activities in cyber field.

20 (a) Hacking: Hacking is defined as unauthorized access to data held on computer system. Hacking is often caused by employees of a company who have inside knowledge of particular users and passwords. The ability of such hackers to carry out illegal actions without being detected is hampered by the audit and monitor software that comes with operating systems. The motive behind hacking can often be mischievous, computing student who are learning about operating system may take delight in penetrating a school's security system to prove that it can be done.

(b) Viruses: Viruses are generally developed with a definite intention to damage computer files or, cause inconvenience and annoyance to computer user. The virus usually overwrites the first few instructions of a particular program on an infected disk and relies on a user choosing to execute that program. When an infected program is executed the virus spreads by first series of instructions. In most cases the viruses first action is to copy itself from the diskette into the PC and hide within obscure files. The virus can then proceed to perform any of the tasks ranging from irritating to disaster such as reformatting the hard disk. Some viruses lie sleeping waiting to be particular event or date the 'Friday 13th virus' being a well-known one. The virus then infect other diskettes or spreads through e-mail to other system.

(c) Spamming: Spam are unwanted e-mail which are business related and sent to the e-mail account in bulk. This fills the e-mail storage capacity and wastes user time because the subject are shown very attractive like- 'Some one is waiting for you', 'Get a car free', 'Give answer and be millionaire' etc., and users could not resist themselves from reading it. Some times they get many links on that e-mail and visit on different web sites. Thus it is clear that spams are unwanted e-mail which waste our time, efforts and cover the memory space Sometimes they send virus too. (ii) The three steps that can be taken to help in preventing computer related crimes are:

(a) In Cyber act 2000 there are various sections in which hackers can be punished. In section 43 and 44 punishment are very hard so it is very difficult to courage to hack the system. According to section 43 of Cyber act 2000 the hacker can be fined upto Rs. One crore.

(b) To protect the computer from virus users must have a latest powerful anti virus software which can scan all types of virus and kill them if encountered.

(c) To protect the computer against spam, there are some tools know as filter. The filters are software which control the flow of e-mail, Spam Cide Spam Hater, Spam Attack Pro and Spam EX are example of such filters.

21 Measure that can betaken include:

(i) Physical restrictions to the computer departments. Most organizations require all employees to wear an ID badge. The computer rooms are commonly protected from access by a locked door, which can only be opened by authorized personnel.

(ii) While using a computer terminal, people are require to sign on with a user-ID and password, Password must not be written down must not be composed of common names, word or dates and must be changed frequently.

(iii) Restrictions are placed on the location and time at which computer can be used to access data. So that for example a user in the production department will not be able to access records.

IV) Special software can be installed on a computer system which will maintain an 'audit' of who has logged on from which computer terminal and for how much time. This will enable any unusual activity to be spotted and investigations made.

22 Internal Threats: Data and programs within a computer system are vulnerable to deliberate and accidental destruction both from within an organization and from outside it. When it is floppy disk, Which after months of the project loading without complaint. comes up with a message, disk unreliable, then it is termed as Internal Threat to the system.

External Threats: Criminals hacking into major banks computer system can steal millions or rupees i.e., by transferring money to phony accounts or making fund credit and purchased. This phenomenon is called as External Threat to the system.

23 Internal Threats to the System.

Some Internal Threats to the System are as follows.

(i) Hardware Failure:- A disk head crash for example can make the contents of a hard disk unreadable.

(ii) Faulty Procedures:- A careless employees who makes entries into an accounts system can cause havoc.

(iii) Natural Disasters:- Fire flood hurricanes and earthquakes can destroy a building taking every last customer record with it.

(iv) Dishonest staff:- Computer systems are vulnerable fraud and theft of data both from inside and outside the organization.

24 External Threats to the Systems.

(i) Hackers gaining entry to company databases and stealing or corrupting data or using the information gained to carry out fraudulent transactions.

(ii) Viruses being downloaded from the internet.

Unless system are perceived to be secure organization many suffer from a lack of confidence by the customers. Bank are generally reluctant to disclose how much money they have lost through insecure systems. Many people are unwilling to give credit card numbers while making purchased through the Internet.

25 Privacy:- Privacy includes the person's private information such as address, phone number social security number and so on.

Many companies routinely monitor their employees communications due to several compelling reasons:-

(i) To protect trade secrets.

(ii) To prevent the distribution of libelous or slanderous messages.

(iii) To prevent the system's users from downloading or copying data that is illegal pornographic or infected by computer viruses.

(iv) To ensure that organizational resources are not being wasted or abused.

26 . Software ethics refer to ensuring that the software being used is not pirated or unauthorized. These also include developers should be given a fair return of their work.

27 . The right to privacy also involves the decisions pertaining to question like what information about one's self or one's associations must a person reveal to other under what conditions and with what safeguards? What things can people keep to them and not be forced to reveal to others?

28. Intellectual property rights are the rights of the owners of information to decide how much information is to be exchanged shared or distributed. Also it given the owners a rights to decide the price for doing (exchanging/ sharing/ distributing) so.

29. The biggest illegal issue affecting the computer industry is Software Piracy. Software Piracy is the illegal copying of programs. it is a crime that effects the sale of original software and encourage illegal work of theft of the effort of the original software makers. Software's are pirated in many ways. The simplest method is to copy the software from its original floppy disk or CD disk. The piracy is painful for users also because the buyer's does not take any responsibility, if any action is taken against users by police or software manufacturer.

30. Studies have shown that in many countries computer use in schools is dominated by men. Female teachers have less regard for their own skills and knowledge than their male counterparts. Females know less about IT, enjoy using the computers less than male students and perceive more problems with software.

31

1. Difference in parental support
2. Restricted access to computers
3. Fewer female role models and a casual approach towards computer activities in school.

32 : Biometrics are automated methods of recognizing a person based on a physiological or behavioral characteristic. Among the features measured are face, fingerprints, hand geometry, handwriting, iris, retinal, vein, and voice. Biometric data are separate and distinct from personal information. Biometric templates cannot be reverse-engineered to recreate personal information and they cannot be stolen and used to access personal information.

Using a unique, physical attribute of your body, such as your fingerprint or iris, to effortlessly identify and verify that you are who you claim to be, is the best and easiest solution in the market today. That is the simple truth and power of Biometrics Technology today. Although biometric technology has been around for many years, modern advances in this emerging technology, coupled with big reductions in cost, now make biometrics readily available and affordable to consumers, small business owner, larger corporations and public sector agencies alike.

SAMPLE PAPERS

CLASS XII

INFORMATICS PRACTICES NEW (065)

BLUE PRINT (2019-20)

CLASS XII

INFORMATICS PRACTICES NEW (065)

S. No	Typology of Questions	Very Short Answer (VSA) (1 mark)	Short Answer-I (SA-I) (2 marks)	Short Answer -II (SA-II) (3 marks)	Long Answer (L.A.) (4 marks)	Total Marks
1	Data Handling - 2	7 (7)	5 (10)	3 (9)	1 (4)	30
2	Basic Software Engineering	3 (3)	1 (2)	2 (6)	1 (4)	15
3	Data Management -2	5 (5)	---	2 (6)	1(4)	15
4	Society, Law and Ethics -2	2 (2)	4 (8)	---	---	10
	TOTAL	17 (17)	10 (20)	7 (21)	3 (12)	37 (70)

SAMPLE QUESTION PAPER (2019-20)

General Instructions:

- All questions are compulsory
- Question Paper is divided into 4 sections A,B,C and D.
- Section A comprises of questions(1 and 2)
 - (i) Question 1 comprises Data Handling-2(DH-2) (Series, Numpy)
 - (ii) Question 2 comprises of question from Data Handling -2(DH-2)(Data Frames and its operations)
- Section B comprises of questions from Basic Software Engineering.
- Section C comprises of questions from Data Management-2(DM-2)
- Section C comprises of questions from Society, Law and Ethics-2(SLE-2)

Section A			
Answer the following questions:			
1	a)	Find the output of the following program: import numpy as np a=np.array([30,60,70,30,10,86,45]) print(a[2:5:2])	1
	b)	x=np.array([1,2,3]) y=np.array([3,2,1]) z=np.concatenate([x,y]) print(z)	1
	c)	Write the Python command to create a histogram on the list named height containing height of students. OR Name the functions you will use to create i) Line chart ii) bar chart	1
	d)	Predict the output of the following code fragments. Assume library Numpy has been imported as np: A=np.array([[7,5], [1,6]]) x=np.array([1,2])	2

		<code>print(np.vstack([x,A]))</code>											
	e)	<p>Create a horizontal bar graph of following data. Add suitable labels.</p> <table border="1"> <thead> <tr> <th>City</th> <th>Population</th> </tr> </thead> <tbody> <tr> <td>Delhi</td> <td>23456123</td> </tr> <tr> <td>Mumbai</td> <td>20083104</td> </tr> <tr> <td>Bangalore</td> <td>18456123</td> </tr> <tr> <td>Hyderabad</td> <td>13411093</td> </tr> </tbody> </table>	City	Population	Delhi	23456123	Mumbai	20083104	Bangalore	18456123	Hyderabad	13411093	2
City	Population												
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Bangalore	18456123												
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	f)	Differentiate between series data structure and data frame data structure?	2										
	g)	<p>Write a Numpy program to extract all odd numbers from a 1D array</p> <p>Input arr = [0,1,2,3,4,5,6,7,8,9]</p> <p>Output: 1 3 5 7 9</p> <p style="text-align: center;">OR</p> <p>Write a Numpy program to compute sum of all elements, sum of each column and sum of each row of a given row.</p> <p>Input: [[0 1] [2 3]]</p> <p>Sum of all elements: 6</p> <p>Sum of each column : [2 4]</p> <p>Sum of each row : [1 5]</p>	3										
Answer the following questions													
2	a)	<p>_____ function applies the passed function on each individual data element of the dataframe.</p> <p>i) apply() ii) applymap() iii) pivot() iv) pivot_table()</p>	1										
	b)	<p>A dictionary smarks contains the following data: Smarks={'name':['rashmi','harsh','priya'],'grade':['A1','A2','B1']}</p> <p>Write a statement to create DataFrame called df. Assume that pandas has been imported as pd.</p> <p style="text-align: center;">OR</p> <p>In pandas S is a series with the following result: S=pd.Series([5,10,15,20,25])</p> <p>The series object is automatically indexed as 0,1,2,3,4. Write a statement to assign the series as a,b,c,d,e index explicitly.</p>	1										
	c)	Which function is used to generate a quartile in python?	1										
	d)	Write python statement to delete the 3 rd and 5 th rows from dataframe df.	1										
	e)	What is the use of pipe() in python pandas? Give example.	2										
	f)	<p>Write python statements to create a data frame for the following data.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Age</th> <th>Designation</th> </tr> </thead> <tbody> <tr> <td>RAJIV</td> <td>20</td> <td>CLERK</td> </tr> </tbody> </table>	Name	Age	Designation	RAJIV	20	CLERK	2				
Name	Age	Designation											
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		SAMEER 35 KAPIL 45	MANAGER ACCOUNTANT																																										
	g)	Write one python program to find the following from the given dataframe DF			3																																								
		<table border="1"> <thead> <tr> <th>Rollno</th> <th>Name</th> <th>Age</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Arun</td> <td>18</td> <td>68</td> </tr> <tr> <td>2</td> <td>Mohit</td> <td>14</td> <td>47</td> </tr> <tr> <td>3</td> <td>Karan</td> <td>13</td> <td>78</td> </tr> <tr> <td>4</td> <td>Lalit</td> <td>16</td> <td>87</td> </tr> <tr> <td>5</td> <td>Ravi</td> <td>14</td> <td>60</td> </tr> </tbody> </table>	Rollno	Name	Age	Marks	1	Arun	18	68	2	Mohit	14	47	3	Karan	13	78	4	Lalit	16	87	5	Ravi	14	60																			
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5	Ravi	14	60																																										
		a) Maximum marks b) sum of all the marks c) Mean of age of the students																																											
	h)	Find the output of the following code:			3																																								
		<pre>import pandas as pd data = [{'a': 1, 'b': 2}, {'a': 5, 'b': 10, 'c': 20}] #With two column indices, values same as dictionary keys df1 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b']) #With two column indices with one index with other name df2 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b1']) print(df1) print(df2)</pre>																																											
	g)	Given the two dataframes df1 and df2 as given below:			4																																								
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		Write the commands to do the fo (i) To add dataframes df1 and df2 (ii) To sort df1 by Second column (iii) To change the index of df2 frc (iv) To display those rows in df1 where value of third column is more than 45. – p339 saho xi																																											
Section B																																													
3	a)	Which model is also called incremental waterfall model? (i) Evolutionary model (ii) Spiral Model (iii) Component Based Model (iv) Agile model			1																																								
	b)	_____ is the process of repeatedly updating the software to meet changing needs. (i) evaluation (ii) Validation			1																																								

		(iii) maintenance (iv) Analysis	
	c)	What is agile software development?	1
	d)	Write any four features of sprints. OR What are the various steps in waterfall model of software development?	2
	e)	Write any three differences between water fall model and evolutionary model of s/w engineering? OR State three difference between incremental and spiral model of delivery.	3
	f)	What is version control system? What are differences between commit / update and push/pull requests?	3
	g)	Draw a use-case diagram for a taxi booking app and simple banking system	4
Section C			
4	a)	Name the files that are found in project's application folder	1
	b)	What is the differences between Update and Alter Commands of MySQL? OR What is the difference between commit and rollback command of MySQL?	1
	c)	What are two types of HTTP requests?	1
	d)	Find the error in the following command: Select * from Employee where Comm=NULL;	1
	e)	What is the difference between Char and Varchar data type of MySQL?	1
	f)	Compare Having Clause and Order by clause with example?	3
	g)	Consider the table EMP and answer the questions following it: Table : EMP Columns: Eno, Ename, Gender, DOB, Hiredate, Sal, Comm (i) To increase the field width of ENAME to 20 instead of 15 (ii) To increase the salary by 5% of all those employees (iii) To delete the details of those employees who joined after 1985	3

h)	<p>Write SQL Commands and the output for following queries . Table : Shop</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Shop_name</th> <th>Sale</th> <th>Area</th> <th>Cust_percent</th> <th>Rating</th> <th>City</th> </tr> </thead> <tbody> <tr><td>1</td><td>West_Side</td><td>250000</td><td>West</td><td>68.6</td><td>C</td><td>Delhi</td></tr> <tr><td>2</td><td>Pantaloons</td><td>500000</td><td>South</td><td>81.8</td><td>A</td><td>Chennai</td></tr> <tr><td>3</td><td>Sir's & Her's</td><td>300000</td><td>North</td><td>79.8</td><td>B</td><td>Amritsar</td></tr> <tr><td>4</td><td>Sports King</td><td>380000</td><td>North</td><td>88.0</td><td>B</td><td>Baroda</td></tr> <tr><td>5</td><td>Biswas Stores</td><td>456000</td><td>East</td><td>92.0</td><td>A</td><td>Delhi</td></tr> <tr><td>6</td><td>Big Bazar</td><td>290000</td><td>South</td><td>66.7</td><td>A</td><td>Kolkota</td></tr> <tr><td>7</td><td>Levis</td><td>230000</td><td>East</td><td>50.0</td><td>C</td><td>Jameshdpur</td></tr> <tr><td>8</td><td>Peter England</td><td>428000</td><td>South</td><td>90.0</td><td>A</td><td>Chennai</td></tr> </tbody> </table> <p style="text-align: right;">a) To</p> <p>display the name of all shop which are in area South and sale more than average sale. (b) To display the city along with sum of sale for each city (c) Give the output of the following sql statements. (i) Select min(sale) from shop where sale>300000 group by sales; (ii) Select count(distinct city) from shop; (iii) select avg(sale) from shop where Area='South'; (iv) select avg(Cust_percentage),sum(sale) from shop where rating ='A';</p> <p style="text-align: center;">OR</p> <p>Consider the table Employee table with the following structure:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Column name</th> <th>Data Type</th> <th>Size</th> <th>Constraint</th> </tr> </thead> <tbody> <tr><td>Empno</td><td>Char</td><td>4</td><td>Primary Key</td></tr> <tr><td>Name</td><td>Varchar</td><td>25</td><td></td></tr> <tr><td>Dateofjoin</td><td>Date</td><td></td><td></td></tr> <tr><td>Gender</td><td>Char</td><td>1</td><td></td></tr> <tr><td>Salary</td><td>Decimal</td><td>8,2</td><td></td></tr> <tr><td>Deptcode</td><td>Char</td><td>4</td><td></td></tr> </tbody> </table> <p>Write a python program to read all the rows from Employee table whose salary is between 40000 and 60000. Display the rows in a formatted manner. P-418 saho</p>	No	Shop_name	Sale	Area	Cust_percent	Rating	City	1	West_Side	250000	West	68.6	C	Delhi	2	Pantaloons	500000	South	81.8	A	Chennai	3	Sir's & Her's	300000	North	79.8	B	Amritsar	4	Sports King	380000	North	88.0	B	Baroda	5	Biswas Stores	456000	East	92.0	A	Delhi	6	Big Bazar	290000	South	66.7	A	Kolkota	7	Levis	230000	East	50.0	C	Jameshdpur	8	Peter England	428000	South	90.0	A	Chennai	Column name	Data Type	Size	Constraint	Empno	Char	4	Primary Key	Name	Varchar	25		Dateofjoin	Date			Gender	Char	1		Salary	Decimal	8,2		Deptcode	Char	4		4
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Section D

5	<p>a) What is Plagiarism ?</p>	1
	<p>b) Give two examples of online fraud. What measures can you take to curb online frauds?</p>	2
	<p>c) How can we can manage E-waste? (two points)</p>	1
	<p>d) Neelam has recently shifted to new city and new College .She does not many people in her new city and school. But all of a sudden, someone is posting negative, demeaning comments on her social networking profile, college site's forum etc. She is also getting repeated mails from unknown people. Everytime she goes online, she finds someone chasing her online. a) What is this happening to Neelam? b) What action should she taken to stop them?</p>	2

e)	Explain the phishing and computer forensics.	2
f)	Write two advantages of Online Campaigning? OR Give brief description about Bitcoin.	2

***** End of Paper *****

Max Marks: 70

Time: 3 hrs

Section A		
Answer the following questions:		
1	a)	[70 10] 1 mark for correct answer
	b)	[1 2 3 3 2 1] 1 mark for correct answer
	c)	plt.hist(height) 1 mark for correct answer Or (i) plt.plot() (ii) plt.bar() ½ mark each for correct answer
	d)	[[1 2] [7 5] [1 6]] 2 marks for correct answer.
	e)	import numpy as np import matplotlib.pyplot as plt Cities=['Delhi','Mumbai','Bangalore','Hyderabad'] Population=[23456123,20083104,18456123,13411093] plt.barh(Cities,Population) plt.ylabel('Cities') plt.xlabel('Population') plt.show() ½ mark for lists ½ mark for barh() function ½ mark for labels ½ mark for show()
	f)	A series is one dimensional object that can hold any data type such as integers, floats, and strings. It has only one axis. A DataFrame is two dimensional object that can hold different data types. Individual columns of a dataframe can act as a separate series object. 1 mark each for correct definition/difference of each.
	g)	import numpy as np

		<pre>arr=np.array([0,1,2,3,4,5,6,7,8,9]) for i in range(len(arr)): if(arr[i]%2!=0): print(arr[i],end=' ') 1 mark for declaring array using numpy ½ mark for for loop 1 mark for correct if statement ½ mark for print OR import numpy as np x=np.array([[0,1],[2,3]]) print('Sum of all elements:') print(np.sum(x)) print('Sum of each column:') print(np.sum(x,axis=0)) print('sum of each row:') print(np.sum(x,axis=1)) ½ mark for declaring array using numpy ½ mark for sum of all elements 1 mark for sum of each column 1 mark for sum of each row</pre>
Answer the following questions		
2	a)	<pre>applymap() 1 mark for correct answer</pre>
	b)	<pre>import pandas as pd Smarks={'name':['rashmi','harsh','priya'],'grade':['A1','A2','B1']} df=pd.DataFrame(Smarks) print(df) 1 mark for correct answer OR import pandas as pd S=pd.Series([5,10,15,20,25],index=['a','b','c','d','e']) print(S) 1 mark for correct answer</pre>
	c)	<pre>quantile() 1 mark for correct answer</pre>
	d)	<pre>df.drop([2,4]) 1 mark for correct answer</pre>
	e)	<pre>pipe() function performs the operation on the entire dataframe with the help of user defined or library functions. Any example. 1 mark for correct definition 1 mark for correct example</pre>
	f)	<pre>import pandas as pd d={'Name':['RAJIV','SAMEER','KAPIL'], 'Age':[20,35,45],'Designation':['CLERK','MANAGER','ACCOUNTANT']}</pre>

		<pre>df=pd.DataFrame(d) print(df)</pre> <p>½ mark for importing pandas 1 mark for creating dictionary ½ mark for using DataFrame function</p>
	g)	<pre>a. print("Maximum marks = ", DF["Marks"].max()) b. print("Sum of marks = ", DF["Marks"].sum()) c. print("Mean of Age = ",DF["Age"].mean())</pre> <p>1 mark for each correct answer</p>
	h)	<p>Find the output of the following code</p> <pre> a b first 1 2 second 5 10 a b1 first 1 NaN second 5 NaN</pre> <p>1 mark for correct index and column name in both cases 1 mark each for correct output (values) of both cases</p>
	g)	<pre>(i) df1+df2 (ii) dfa=df1.sort_values('Second',ascending=False) (iii) import pandas as pd d={'First':[1,2,3,4],'Second':[5,6,7,8]} df2=pd.DataFrame(d,index=['a','b','c','d']) (iv) df1['Third'].gt(50)</pre> <p>1 mark each for correct answer</p>
Section B		
3	a)	<p>Evolutionary model 1 mark for correct answer</p>
	b)	<p>Maintenance 1 mark for correct answer.</p>
	c)	<p>It is a set of methods and practices where solutions evolve through collaboration between self organizing, cross functional teams. 1 mark for above definition or any suitable definition.</p>
	d)	<p>Features of sprints:</p> <ol style="list-style-type: none"> 1. Sprints are periods of time when software development is actually done. 2. A sprint lasts from one week to one month to complete an item from the backlog. 3. The goal of sprint is to create a saleable product. 4. Each sprint ends with sprint review. <p>½ mark each for above or any correct feature.</p> <p style="text-align: center;">OR</p> <p>Steps in waterfall model of software development: Requirement specification, Analysis and System design, Implementation and Unit Testing, Integration and System Testing, Operation and maintenance.</p>

		2 marks for correct sequence of steps.
	e)	1 mark for each correct difference. OR 1 mark for each correct difference
	f)	1 mark for correct definition of VCS. 1 mark for commit / update 1 mark for push / pull requests.
	g)	2 marks for correct use case diagram of taxi booking app. 2 marks for correct use case diagram of simple banking system.
Section C		
4	a)	__init__.py, settings.py, urls.py and wsgi.py 1 mark for correct answer. (Any two correct files)
	b)	½ mark for update and ½ mark for alter command. OR ½ mark for commit and ½ mark for rollback
	c)	Get and Post ½ mark for each correct request
	d)	Select * from Employee where Comm is Null; 1 mark for correct query
	e)	Char – fixed length string Varchar – Variable length string ½ mark for each correct answer.
	f)	Compare Having Clause and Order by clause with example? ½ mark for correct definition of Having ½ mark for correct definition of Order by 1 mark for correct example of Having 1 mark for correct example of Order by
	g)	(i) ALTER TABLE EMP MODIFY ENAME(VARCHAR(20)); (ii) UPDATE EMP SET Sal=Sal +Sal*0.05; (iii) DELETE FROM EMP WHERE YEAR(Hiredate)>1985; 1 mark for each correct query

	h)	<p>a) select shop_name from shop where area like 'South' and sale>avg(sale); b) select city, sum(sale) from shop group by city; c) i) Min(sale) ----- 380000 428000 456000 500000 ii) Count(Distinct(City)) ----- 6 iii) Avg(sale) ----- 4060000 iv) Area ----- East North South</p> <p>1 mark for each correct query ½ mark each for correct output</p> <p style="text-align: center;">OR</p> <p>1 mark for opening database connection ½ mark for creating cursor ½ mark for sql query ½ mark for fetchall() ½ mark for correct for loop 1 mark for printing in correct format</p>
Section D		
5	a)	1 mark for correct definition
	b)	½ mark for each correct online fraud ½ mark each for each measure to curb online fraud.
	c)	½ mark each for correct method of E-waste
	d)	<p>a) Nivedita has become a victim of cyber bullying and cyber stalking. b) She must immediately bring it into the notice of her parents and school authorities and she must report this cyber crime to local police with the help of her parents.</p> <p>1 mark for each correct answer.</p>
	e)	<p>Phishing is the practice of attempting to acquire sensitive information from individuals over internet, by means of deception. Computer forensics refers to methods used for interpretation of computer media or digital evidence.</p> <p>1 mark for correct definition of phishing. 1 mark for correct definition of computer forensics.</p>

	f)	1 mark each for correct advantage of Online Campaigning. OR 2 marks for correct description about Bitcoin.
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***** End of Paper *****

CLASS XII
INFORMATICS PRACTICES (065)
SAMPLE QUESTION PAPER (2019-20)

Max Marks : 70
: 3hrs

Time

General Instructions:

All questions are compulsory

Question Paper is divided into 4 sections A, B, C and D

Section A comprises of questions (1 and 2)

(i) Question 1 comprises Data Handling-2 (DH-2)(Series, Numpy)

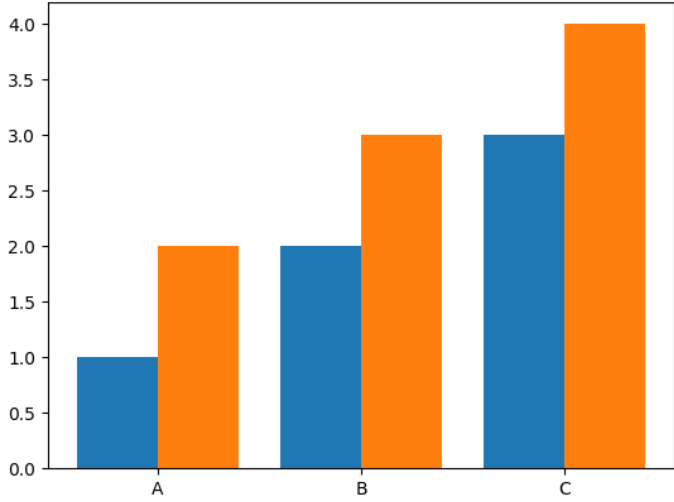
(ii) Question 2 comprises of question from Data Handling-2(DH-2) (Data Frames and its operations)

Section B comprises of questions from Basic Software Engineering

Section C Comprises of questions from Data Mangment-2 (DM-2)

Section D comprises of questions from Society, Law and Ethics-2 (SLE-2)

SECTION A			
Answer the following questions			
1	(a)	How would you create this identity matrix in python? (a) np.eye(3) (b) identity(3,2) (c)np.array([1, 0, 0], [0, 1, 0], [0, 0, 1]) (d)All of these	1
	(b)	Consider the matrix of 5 observations each of 3 variables X_0, X_1, X_2 whose observed values are held in the three rows of the array X: $X = \text{np.array}([[0.1, 0.3, 0.4, 0.8, 0.9], [3.2, 2.4, 2.4, 0.1, 5.5], [10., 8.2, 4.3, 2.6, 0.9]])$ Write the python statement to print the covariance of X and state that what does the diagonal element of the resultant matrix depicts.	1
	(c)	Mr Ajay wants to plot a horizontal bar graph of the above given set of values with programming language on x axis and its popularity on y axis with following code. import matplotlib.pyplot as plt x = ['Java', 'Python', 'PHP', 'JS', 'C#', 'C++'] popularity = [22.2, 17.6, 8.8, 8, 7.7, 6.7] _____ Statement 1 plt.xlabel("Popularity") plt.ylabel("Languages") plt.show() Complete the code by writing statement1 to print the horizontal bar graph with colour green <p style="text-align: center;">Or</p> Complete the Python program in blank line to draw a scatter graph taking a random distribution in X and Y and plotted against each other in red colour. import matplotlib.pyplot as plt X = randn(200)	1

	<pre>Y = randn(200)</pre> <hr/> <pre>plt.xlabel("X") plt.ylabel("Y") plt.show()</pre>													
(d)	<p>Suppose you want to join train and test dataset (both are two numpy arrays train_set and test_set) into a resulting array (resulting_set) to do data processing on it simultaneously. This is as follows:</p> <pre>train_set = np.array([1, 2, 3]) test_set = np.array([[0, 1, 2], [1, 2, 3]]) resulting_set --> [[1, 2, 3], [0, 1, 2], [1, 2, 3]]</pre> <p>How would you join the two arrays?</p>	2												
(e)	<p>Write the code to plot the following figure in python</p>  <table border="1"> <caption>Data for the grouped bar chart</caption> <thead> <tr> <th>Group</th> <th>Blue Bar Value</th> <th>Orange Bar Value</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>1.0</td> <td>2.0</td> </tr> <tr> <td>B</td> <td>2.0</td> <td>3.0</td> </tr> <tr> <td>C</td> <td>3.0</td> <td>4.0</td> </tr> </tbody> </table>	Group	Blue Bar Value	Orange Bar Value	A	1.0	2.0	B	2.0	3.0	C	3.0	4.0	2
Group	Blue Bar Value	Orange Bar Value												
A	1.0	2.0												
B	2.0	3.0												
C	3.0	4.0												
(f)	Write a Pandas program to convert a NumPy array to a Pandas series	2												
(g)	<p>Write a NumPy program to create a 2d array with 1 on the border and 0 inside.</p> <p>Original array:</p> <pre>[[1. 1. 1. 1. 1.] [1. 1. 1. 1. 1.] [1. 1. 1. 1. 1.] [1. 1. 1. 1. 1.] [1. 1. 1. 1. 1.]]</pre> <p>Expected Output:</p> <p>1 on the border and 0 inside in the array</p> <pre>[[1. 1. 1. 1. 1.] [1. 0. 0. 0. 1.] [1. 0. 0. 0. 1.] [1. 0. 0. 0. 1.] [1. 1. 1. 1. 1.]]</pre>	3												

		Or	
		Write a NumPy program to create a random 10x4 array and extract the first five rows of the array and store them into a variable	
2	(a)	All pandas data structures are ___-mutable but not always _____-mutable. a) size,value b) semantic,size c) value,size d) none of the Mentioned	1
	(b)	Suppose we make a dataframe as df = pd.DataFrame(['ff', 'gg', 'hh', 'yy'], [24, 12, 48, 30], columns = ['Name', 'Age']) What is the difference between the two data series given below? df['Name'] and df.loc[:, 'Name'] or A dictionary Grade contains the following data: Grade = {'Name' : ['Rashmi', 'Harsh', 'Ganesh', 'Priya', 'Vivek', 'Anita', 'Karthik'], 'Grade' : ['A1', 'A2', 'B1', 'A1', 'B2', 'A2', 'A1']} Add a column called Percentage with following data: [92, 89, None, 95, 68, None, 93]	1
	(c)	A vector x is given with the following even number x = [2, 5, 6, 10, 11, 13] what will the output of the following print(x.quantile([0.25, 0.50, 0.75]))	1
	(d)	Calculate the mean of specific numeric columns (Test1, Test2, Test3) row-wise for DataFrame df excluding null values. Also display the result in 2 decimal formats.	1
	(e)	A dictionary Grade contains the following data: Grade = {'Name' : ['Rashmi', 'Harsh', 'Ganesh', 'Priya', 'Vivek', 'Anita', 'Karthik'], 'Grade' : ['A1', 'A2', 'B1', 'A1', 'B2', 'A2', 'A1']} (i) Drop the column (i.e., Grade) by name. (ii) Delete the 3rd and 5th rows rows.	2
	(f)	Write a Pandas program to add, subtract, multiple and divide two Pandas Series. or Write a python program to change the order of index of a given series. For ex if Original Data Series is : A 1 B 2 C 3 D 4 E 5 Data Series after changing the order of index: B 2 A 1 C 3 D 4 E 5	2
	(g)	A dataframe df1 is given with following data:	3

	<p style="text-align: center;">English Accounts Economics Bst IP</p> <p>Name Aashna 87.0 76.0 82.0 72.0 78.0 Simran 64.0 76.0 69.0 56.0 75.0 Jack 58.0 68.0 78.0 63.0 82.0 Raghu 74.0 72.0 67.0 64.0 86.0 Somya 87.0 82.0 78.0 66.0 67.0 Ronald 78.0 68.0 68.0 71.0 71.0</p> <p>Write the command to given an increment of 5% to all students to DataFrame df1 using applymap() function.</p> <p style="text-align: center;">Or</p> <p>Consider the data frame dfC = pd.DataFrame({'Student Name' : ['TANVI GUPTA', 'MRIDUL KOHLI', 'DHRUV TYAGI', 'SAUMYA PANDEY', 'ALEN RUJIS', 'MANALI SOVANI', 'AAKASH IRENGBAM', 'SHIVAM BHATIA'],'Height' : [60.0, 62.9, np.nan, 58.3, 62.5, 58.4, 63.7, 61.4], 'Weight' : [54.3, 56.8, 60.4, 58.3, np.nan, 57.4, 58.3, 55.8]})</p> <p>(i) Count the number of non-null value across the column for DataFrame dfC. (ii) Find the most repeated value for a specific column 'Weight' of DataFrame dfC. (iii) Find the median of hieght and weight column for all students using DataFrame dfC</p>																																											
(h)	<p>Consider the following data frame of automobile</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>index</th> <th>company</th> <th>body-style</th> <th>wheel-base</th> <th>num-of-cylinders</th> <th>price</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>bmw</td> <td>sedan</td> <td>101.2</td> <td>four</td> <td>16925</td> </tr> <tr> <td>1</td> <td>bmw</td> <td>sedan</td> <td>101.2</td> <td>six</td> <td>20970</td> </tr> <tr> <td>2</td> <td>honda</td> <td>sedan</td> <td>96.5</td> <td>four</td> <td>12945</td> </tr> <tr> <td>3</td> <td>honda</td> <td>sedan</td> <td>96.5</td> <td>four</td> <td>10345</td> </tr> <tr> <td>4</td> <td>toyota</td> <td>hatchback</td> <td>95.7</td> <td>four</td> <td>5348</td> </tr> <tr> <td>5</td> <td>toyota</td> <td>hatchback</td> <td>95.7</td> <td>four</td> <td>6338</td> </tr> </tbody> </table> <p>(i) From the given data set print first and last five rows (ii) Find the most expensive car company name (iii) Sort all cars by price columns</p>	index	company	body-style	wheel-base	num-of-cylinders	price	0	bmw	sedan	101.2	four	16925	1	bmw	sedan	101.2	six	20970	2	honda	sedan	96.5	four	12945	3	honda	sedan	96.5	four	10345	4	toyota	hatchback	95.7	four	5348	5	toyota	hatchback	95.7	four	6338	3
index	company	body-style	wheel-base	num-of-cylinders	price																																							
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4	toyota	hatchback	95.7	four	5348																																							
5	toyota	hatchback	95.7	four	6338																																							
(i)	<p>A dataframe dfB is given with following data:</p> <p>Itemno ItemName Color Price 1 Ball Pen Black 15.0 2 Pencil Blue 5.5 3 Ball Pen Green 10.5 4 Gel Pen Green 11.0 5 Notebook Red 15.5 6 Ball Pen Green 11.5</p>	4																																										

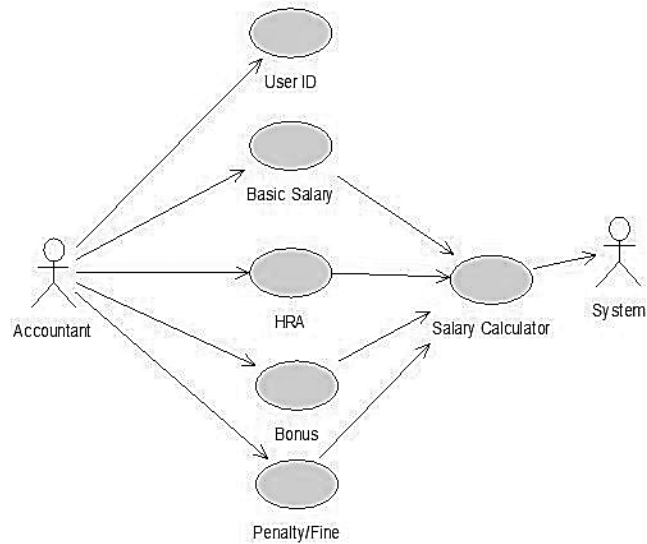
		<p>7 Highlighter Blue 8.5 8 Gel Pen Red 12.5 9 P Marker Blue 8.6 10 Pencil Green 11.5 11 Ball Pen Green 10.5</p> <p>Answer the following questions (a) Display Color wise item and price of each ItemName category. (b) Find the maximum price of each ItemName. (c) Find the minimum price of each ItemName. (d) Count the number of items in each ItemName category.</p>	
SECTION B			
3	(a)	<p>The Incremental Model is a result of combination of elements of which two models?</p> <p>a) Build & FIX Model & Waterfall Model b) Linear Model & RAD Model c) Linear Model & Prototyping Model d) Waterfall Model & RAD Model</p>	1
	(b)	<p>Which one of the following is not an Evolutionary Process Model?</p> <p>a) WINWIN Spiral Model b) Incremental Model c) Concurrent Development Model d) All of the mentioned</p>	1
	(c)	<p>Which of the following does not apply to agility to a software process?</p> <p>a) Uses incremental product delivery strategy b) Only essential work products are produced c) Eliminate the use of project planning and testing d) All of the mentioned</p>	1
	(d)	<p>List any two differences between Agile method and Waterfall model?</p> <p style="text-align: center;">Or</p> <p>Write any four points of manifesto of the Agile Software development</p>	2
	(e)	<p>Which model will you implement if customer wants to get partial product early in life cycle? State the model and its advantages and disadvantages?</p> <p style="text-align: center;">Or</p> <p>In which situation you will use concurrent process model? Write its advantage and disadvantage?</p>	3
	(f)	<p>Draw a Use Case Diagram for a typical School including Classes Teacher, Student, Course, Grade, etc</p>	3
	(g)	<p>1. Consider the following scenario involving Git. Alice and Bob are both working on a shared project MyProj that is stored in a remote Git repository. Bob does a clone on the remote repository. What two things does Git create when Bob issues the clone command?</p> <p>2. Next, Bob edits the MyProj file foo.rb. Then, he does a commit and a push. What does Git do when Bob issues these commands?</p>	4

3. Next, Alice does a clone on MyProj. Then, Alice and Bob both edit foo.rb in parallel. foo.rb has over 100 lines of code. Alice edits a couple lines at the top of the file, and Bob edits a couple lines at the bottom of the file. Then, Bob does a commit and a push. Finally, Alice does a commit and a push. What does Git do when Alice issues the push command?

4. What Git commands should Alice issue next and what would the result of the command be?

Or

Look at the following use case diagrams and write the actors and the situation depicted by the Use Case diagram?



SECTION C

4	(a)	Write the django command to create a project name school?	1
	(b)	What is SAVEPOINT?	1
		Or	
		What is Primary Key?	
	(c)	What are two types of HTTP request?	1
	(d)	Write Mysql command that will be used to open an already existing database "Contacts"	1
	(e)	_____ method will return only one row from the resultset in the form of a tuple containing record.	1
	(f)	(i) There is column salary in table employee. The following two statements are giving different outputs. What may be the possible reasons? Select count(*) from employee select count(salary) from employee (ii) Mr. Sanghi created two tables with City as Primary Key in Table1 and Foreign key in Table2 while inserting row in Table2 Mr Sanghi is not able to enter value in the column City. What is the possible reason for it?	3

		(iii) Difference between Alter and Drop																																																																														
	(g)	<p>Consider the following hospital table</p> <table border="1"> <thead> <tr> <th>No</th> <th>Name</th> <th>Age</th> <th>Department</th> <th>Dateofadmin</th> <th>Charge</th> <th>Sex</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Arpit</td> <td>62</td> <td>Surgery</td> <td>21/01/06</td> <td>300</td> <td>M</td> </tr> <tr> <td>2</td> <td>Zayana</td> <td>18</td> <td>ENT</td> <td>12/12/05</td> <td>250</td> <td>F</td> </tr> <tr> <td>3</td> <td>Kareem</td> <td>68</td> <td>Orthopedic</td> <td>19/02/06</td> <td>450</td> <td>M</td> </tr> <tr> <td>4</td> <td>Abhilash</td> <td>26</td> <td>Surgery</td> <td>24/11/06</td> <td>300</td> <td>M</td> </tr> <tr> <td>5</td> <td>Dhanya</td> <td>24</td> <td>ENT</td> <td>20/10/06</td> <td>350</td> <td>F</td> </tr> <tr> <td>6</td> <td>Siju</td> <td>23</td> <td>Cardiology</td> <td>10/10/06</td> <td>800</td> <td>M</td> </tr> <tr> <td>7</td> <td>Ankita</td> <td>16</td> <td>ENT</td> <td>13/04/06</td> <td>100</td> <td>F</td> </tr> <tr> <td>8</td> <td>Divya</td> <td>20</td> <td>Cardiology</td> <td>10/11/06</td> <td>500</td> <td>F</td> </tr> <tr> <td>9</td> <td>Nidhin</td> <td>25</td> <td>Orthopedic</td> <td>12/05/06</td> <td>700</td> <td>M</td> </tr> <tr> <td>10</td> <td>Hari</td> <td>28</td> <td>Surgery</td> <td>19/03/06</td> <td>450</td> <td>M</td> </tr> </tbody> </table> <p>Write the sql query for</p> <p>(i) To reduce Rs 200 from the charge of female patients who are in Cardiology department.</p> <p>(ii) To insert a new row in the above table with the following data : 11, 'Rakesh', 45, 'ENT', {08/08/08}, 1200, 'M'</p> <p>(iii) To remove the rows from the above table where age of the patient > 60.</p>	No	Name	Age	Department	Dateofadmin	Charge	Sex	1	Arpit	62	Surgery	21/01/06	300	M	2	Zayana	18	ENT	12/12/05	250	F	3	Kareem	68	Orthopedic	19/02/06	450	M	4	Abhilash	26	Surgery	24/11/06	300	M	5	Dhanya	24	ENT	20/10/06	350	F	6	Siju	23	Cardiology	10/10/06	800	M	7	Ankita	16	ENT	13/04/06	100	F	8	Divya	20	Cardiology	10/11/06	500	F	9	Nidhin	25	Orthopedic	12/05/06	700	M	10	Hari	28	Surgery	19/03/06	450	M	
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	(h)	<p>Consider the following tables GAMES. Write SQL commands for the statements (i) to (iii) and give outputs for SQL queries (1v) to (v).</p> <table border="1"> <thead> <tr> <th>GCode</th> <th>GameName</th> <th>Number</th> <th>PrizeMoney</th> <th>ScheduleDate</th> </tr> </thead> <tbody> <tr> <td>101</td> <td>Carom Board</td> <td>2</td> <td>5000</td> <td>23-Jan-2004</td> </tr> <tr> <td>102</td> <td>Badminton</td> <td>2</td> <td>12000</td> <td>12-Dec-2003</td> </tr> <tr> <td>103</td> <td>Table Tennis</td> <td>4</td> <td>8000</td> <td>14-Feb-2004</td> </tr> <tr> <td>105</td> <td>Chess</td> <td>2</td> <td>9000</td> <td>01-Jan-2004</td> </tr> <tr> <td>108</td> <td>Lawn Tennis</td> <td>4</td> <td>25000</td> <td>19-Mar-2004</td> </tr> </tbody> </table> <p>(i) To display details of those games which are having PrizeMoney more than 7000.</p> <p>(ii) To display the content of the GAMES table in ascending order of ScheduleDate.</p> <p>(iii) To display sum of PrizeMoney for each of the Number of participation groupings</p> <p>(iv) SELECT COUNT(DISTINCT Number) FROM GAMES;</p> <p>(v) SELECT MAX(ScheduleDate),MIN(ScheduleDate) FROM GAMES;</p> <p style="text-align: center;">Or</p> <p>Write a python code considering a database organization having a table employee to update the salary for employee working in department 10 to 70000</p>	GCode	GameName	Number	PrizeMoney	ScheduleDate	101	Carom Board	2	5000	23-Jan-2004	102	Badminton	2	12000	12-Dec-2003	103	Table Tennis	4	8000	14-Feb-2004	105	Chess	2	9000	01-Jan-2004	108	Lawn Tennis	4	25000	19-Mar-2004	4																																															
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SECTION D																																																																																
5	(a)	<p>_____ is a code injecting method used for attacking the database of a system / website.</p> <p>a) HTML injection</p> <p>b) SQL Injection</p> <p>c) Malicious code injection</p> <p>d) XML Injection</p>	1																																																																													

	(b)	_____ is a famous technological medium for the spread of malware, facing problems of spam, & phishing attacks.	1
	(c)	_____ means authentication of any electronic records by a subscriber by the means of an electronic method.	1
	(d)	What is digital property? Give some examples?	2
	(e)	What are common gender and disability issues faced while teaching/using computers in classroom?	2
	(f)	Explain the issues with the internet Or Define E-waste and how to manage the E-waste	3

CLASS XII
INFORMATICS PRACTICES (065)
MARKING SCHEME 2019-20

SECTION A			
Answer the following questions			
1	(a)	Solution: (A) Option B does not exist (it should be np.identity() and 2 parameters) Option C is wrong, because the syntax is incorrect. So the answer is option A	1 mark
	(b)	print(np.cov(X)) diagonal element represent variance	1 ½ marks for each correct answer
	(c)	plt.barh(x_pos, popularity, color='green') or plt.scatter(X,Y, color='r')	1 marks
	(d)	resulting_set = np.vstack([train_set, test_set])	2 marks
	(e)	import matplotlib as plt Import numpy as np X = ['A','B','C'] Y = [1,2,3] Z = [2,3,4] K= np.arange(len(X)) plt.bar(_X - 0.2, Y, 0.4) plt.bar(_X + 0.2, Z, 0.4) plt.xticks(K, X) plt.show()	2 marks ½ mark for import 1/2 mark for creating array 1 marks for xticks bar and show
	(f)	import numpy as np import pandas as pd np_array = np.array([10, 20, 30, 40, 50]) print("NumPy array:") print(np_array) new_series = pd.Series(np_array) print("Converted Pandas series:") print(new_series)	2 marks 1 mark for creating array 1 mark for converting
	(g)	import numpy as np x = np.ones((5,5)) print("Original array:") print(x) print("1 on the border and 0 inside in the array") x[1:-1,1:-1] = 0 print(x)	3 mark 1 mark for creating array 2 marks for extracting Or

		<p style="text-align: center;">or</p> <pre>import numpy as np x = np.random.rand(10, 4) print("Original array: ") print(x) y= x[:5, :] print("First 5 rows of the above array:") print(y)</pre>	2 marks for creating 1 marks for extracting
2	(a)	C	1 mark
	(b)	2 is view of original dataframe and 1 is a copy of original dataframe. <p style="text-align: center;">Or</p> <pre>Gr["Percentage"] = [92, 89, None, 95, 68, None, 93]</pre>	1 mark
	(c)	0.25 5.25 0.50 8.00 0.75 10.75	1mark
	(d)	<pre>df.loc[:, ['Test1', 'Test2', 'Test3']].mean(axis=1, skipna=False).round(decimals=2)</pre>	1 mark
	(e)	<pre>Gr.drop('Grade',axis=1) Gr.drop([2, 4])</pre>	2 marks 1mark for each correct
	(f)	<pre>import pandas as pd ds1 = pd.Series([2, 4, 6, 8, 10]) ds2 = pd.Series([1, 3, 5, 7, 9]) ds = ds1 + ds2 print("Add two Series:") print(ds) print("Subtract two Series:") ds = ds1 - ds2 print(ds) print("Multiply two Series:") ds = ds1 * ds2 print(ds) print("Divide Series1 by Series2:") ds = ds1 / ds2 print(ds)</pre> <p style="text-align: center;">or</p> <pre>import pandas as pd s = pd.Series(data = [1,2,3,4,5], index = ['A', 'B', 'C', 'D', 'E']) print("Original Data Series:") print(s) s = s.reindex(index = ['B', 'A', 'C', 'D', 'E']) print("Data Series after changing the order of index:") print(s)</pre>	2 marks 1 marks for creating series and 1 marks for showing operations Or 2 marks 1 marks for creating series and 1 marks for reindex
	(g)	<pre>def increase5(x): return x + x*0.05</pre>	3 marks

		df1.applymap(increase5) or (i) dfC.count(axis='columns') (ii) dfC['Weight'].mode() (iii) dfC.loc[:, ['Height', 'Weight']].mean()	1 for def 1 for return 1 for use of applymap Or 1 marks for each
	(h)	(i) df.head(5) df.tail(5) (ii) df = df [['company', 'price']][df.price==df['price'].max()] (iii) carsDf = carsDf.sort_values(by=['price', 'horsepower'], ascending=False)	3 marks 1 marks for each corret answer
	(i)	(a) dfX = dfB.groupby(['ItemName', 'Color']) dfX.first() (b) dfB.groupby('ItemName').Price.max() (c) dfB.groupby('ItemName').Price.min() (d) dfB.groupby('ItemName')['Color'].apply(lambda x: x.count())	4 marks 1 marks for each
SECTION B			
3	(a)	Answer: c Explanation: Each linear sequence produces a deliverable “increment” of the software and particularly when we have to quickly deliver a limited functionality system.	1 mark
	(b)	Answer: d	1 mark
	(c)	Answer:c Explanation: Testing is a major part of each software development process which can't be avoided.	1 mark
	(d)	Waterfall vs. Agile Agile is more flexible than traditional methods (like the waterfall). Here are some key factors that separates the traditional waterfall method versus the more flexible Agile methods, such as Scrum: • Agile and Scrum is based on Iterations while Waterfall is Sequential • Agile and Scrum focus on less documentation • Agile is good for small projects – not so good for larger projects? • If the Customer don't know what he wants in detail – Scrum is a good approach any 2 points Or The Manifesto for Agile Software Development is based on twelve principles: Customer satisfaction by early and continuous delivery of valuable software. Welcome changing requirements, even in late development. Deliver working software frequently (weeks rather than months) Close, daily cooperation between business people and developers Projects are built around motivated individuals, who should be trusted Face-to-face conversation is the best form of communication (co-location) Working software is the primary measure of progress Sustainable development, able to maintain a constant pace Continuous attention to technical excellence and good design Simplicity—the art of maximizing the amount of work not done—is essential Best architectures, requirements, and designs emerge from self-organizing teams	2 marks Or 2 mark ½ mark for each point

	Regularly, the team reflects on how to become more effective, and adjusts accordingly	
(e)	<p>Prototype model At least 2 advantage 2 disadvantage</p> <p style="text-align: center;">or</p> <p>The concurrent development model The concurrent development model is called as concurrent model. The communication activity has completed in the first iteration and exits in the awaiting changes state. The modelling activities completed its initial communication and then go to the underdevelopment state. If the customer specifies the change in the requirement, then the modelling activity moves from the under development state into the awaiting change state. The concurrent process model activities moving from one state to another state.</p> <div style="text-align: center;"> <pre> graph TD Inactive[Inactive] --> UnderDevelopment[Under Development] subgraph ModelingActivity [Modeling activity] UnderDevelopment --> AwaitingChanges[Awaiting changes] UnderDevelopment --> UnderReview[Under review] AwaitingChanges --> UnderRevision[Under revision] UnderRevision --> UnderReview UnderReview --> Baselined[Baselined] Baselined --> Done[Done] UnderReview --> Done end </pre> </div> <p style="text-align: center;">Advantages of the concurrent development model This model is applicable to all types of software development processes. It is easy for understanding and use. It gives immediate feedback from testing. It provides an accurate picture of the current state of a project.</p> <p style="text-align: center;">Disadvantages of the concurrent development model It needs better communication between the team members. This may not be achieved all the time. It requires remembering the status of the different activities.</p>	<p>3 1 for model 1 for advantage and one for disadvantage Or 3 mark 1 for any point of model and any 1 point from advantage and 1 from disadvantage</p>

(f)		3 marks
(g)	<p>1. When Bob issues the checkout command, Git creates a local copy of the MyProj repository and a working directory that contains the latest snapshot of the project files.</p> <p>2 The add commands “stages” the changes. The commit command updates Bob’s local repository to reflect the changes. The push command updates the remote repository to reflect the changes in Bob’s local repository.</p> <p>3 When Alice issues the push command, Git rejects her push because the remote branch has changed since the last time she pulled from it.</p> <p>4. Alice should do a pull on the remote repository. That will update her current branch in her local repository as well as her working directory. The update will both download the changes in the remote repository and merge them into her current branch. To then upload the merged changes, she would need to do an add/commit/push.</p> <p style="text-align: center;">Or</p> <p>Use Case of Payroll management System calculating salary etc.Marks are to be distributed on basis of correct explanation</p>	4 marks 1 marks for each
SECTION C		
4	(a) django-admin startproject school	1mark
	(b) SavePoint : Identiy a point in a transaction to which we can later roll back Or Primary Key : This refers to a set of one or more attributes that can uniquely identify tuples within the relation.	1mark
	(c) GET and POST	1 mark
	(d) Use contacts	1 mark
	(e) fetchone()	
	(f) (i) contain null values	3 mark 1 mark for each

		(ii) 14 Mr Sanghi was trying to enter the name of City in Table2 which is not present in Table1 i.e. Referential Integrity ensures that value must exist in referred table. (iii) alter is used to change the structure of object while update is used to update the record in a table	
	(g)	(i) UPDATE HOSPITAL SET CHARGE = CHARGE – 200 WHERE (DEPARTMENT = 'CARDIOLOGY' AND SEX = 'f'); (ii) INSERT INTO HOSPITAL VALUES (11,'Rakesh',45,'ENT',{08/08/08}, 1200, 'M'); (iii) DELETE FROM HOSPITAL WHERE AGE > 60;	3 marks 1 marks for each
	(h)	(ii) SELECT * FROM GAMES WHERE PrizeMoney>7000; (ii) SELECT * FROM GAMES ORDER BY ScheduleDate; (iii) SELECT SUM(PrizeMoney),Number FROM GAMES GROUP BY Number; (iv) 2 (v) 19-Mar-2004 12-Dec-2003 Or import mysql.connector mydb=mysql.connector.connect(host="localhost",user="root",passwd="123",database="organization") mycursor=mydb.cursor() mycursor.execute("select * from emp") data=mycursor.fetchall() for x in data: print(x) mycursor.execute("update emp set sal={} where empno={}".format(70000,10)) mydb.commit() mycursor.execute("select * from emp") data=mycursor.fetchall() for x in data: print(x)	4 marks 1 marks for query ½ marks for each output
SECTION D			
5	(a)	b	1 mark
	(b)	Email	1 mark
	(c)	Digital Signature	
	(d)	Digital property refers to any information about you created by you that exists in digital form either online or on a storage device eb. Email id, social networking account etc	2 marks
	(e)	under representation of girls, not girl friendly work culture unavailability of teaching material/aid lack of special needs teachers	2marks
	(f)	Describing of net neutrality, internet as echo chamber Or Ewaste is electronic waste and process of ewaste disposal	3 marks

TIME ALLOWED : 3 HRS

MM:70

General Instructions:

- All the questions are compulsory.

Q.1	a	What is the shape of the following 1 2 3 4 5 6 7 8	1
	b	What is the purpose of split() function ?	1
	c	Consider the array A=np.array([10,20,30,40,50,60,70,80,90,100,110,120]).reshape(3,4) what will be the result of (i) print (A[:2, 1:]) (ii) print (A[1:3,3:1:-1])	2
	d	Predict the output of the following code fragments. x=np.array([1,2,3]) y=np.array([3,2,1]) z=np.concatenate([x,y]) print(z)	2
	e	Find the output A =” Kendriya Vidyalaya sangathan” Print(A[2:8])	2
	f	Q1: Underline the Error in the following code of data visualization and then rewrite the rectified code A=range(10,50,12) B=range(90,250,20) matplotlib.pyplot.plot(a,b)	2
Q.2	a	Name the function used to create frequency polygon	2
	b	What is the difference between pivot() and pivot_table() functions	2
	c	What is quartile? How do you generate it in pandas	2
	d	Assume following data is stored in data frame named as df1 Write following commands: (i) Find total sales per state	4

		<p>(ii) find total sales per employee</p> <p>(iii) find total sales both employee wise and state wise</p> <p>(iv) find mean, median and min sale state wise</p> <table border="1"> <thead> <tr> <th>Name of Employee</th> <th>Sales</th> <th>Quarter</th> <th>State</th> </tr> </thead> <tbody> <tr> <td>RSahay</td> <td>125600</td> <td>1</td> <td>Delhi</td> </tr> <tr> <td>George</td> <td>235600</td> <td>1</td> <td>Tamil Naidu</td> </tr> <tr> <td>JayaPriya</td> <td>213400</td> <td>1</td> <td>Kerala</td> </tr> <tr> <td>ManilaSahai</td> <td>189000</td> <td>1</td> <td>Haryana</td> </tr> <tr> <td>RymaSen</td> <td>456000</td> <td>1</td> <td>West Bengal</td> </tr> <tr> <td>ManilaSahai</td> <td>172000</td> <td>2</td> <td>Haryana</td> </tr> <tr> <td>JayaPriya</td> <td>201400</td> <td>2</td> <td>Kerala</td> </tr> </tbody> </table>	Name of Employee	Sales	Quarter	State	RSahay	125600	1	Delhi	George	235600	1	Tamil Naidu	JayaPriya	213400	1	Kerala	ManilaSahai	189000	1	Haryana	RymaSen	456000	1	West Bengal	ManilaSahai	172000	2	Haryana	JayaPriya	201400	2	Kerala	
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Q.3	a	What is the difference between apply() and applymap() methods	2																																
	b	Write a program to calculate covariance, correlation and regression for the given data sets for the number of items purchased with their unit price as under. unit_price=[10,30,50,80,100] no_items = 30,45,40,20,40]	3																																
	c	What is Boxplot? How do you create it in Pyplot?	2																																
	d	<p>Given a data frame namely "data" as shown in adjacent figure. Write code statement to</p> <table border="1"> <thead> <tr> <th></th> <th>Color</th> <th>Count</th> <th>Price</th> </tr> </thead> <tbody> <tr> <td>Apple</td> <td>Red</td> <td>3</td> <td>120</td> </tr> <tr> <td>Apple</td> <td>Green</td> <td>9</td> <td>110</td> </tr> <tr> <td>Pear</td> <td>Red</td> <td>25</td> <td>125</td> </tr> <tr> <td>Pear</td> <td>Green</td> <td>26</td> <td>150</td> </tr> <tr> <td>Lime</td> <td>Green</td> <td>99</td> <td>70</td> </tr> </tbody> </table> <p>(a) Find all rows with label "Apple". Extract all columns</p> <p>(b) List only the columns count and price using loc</p> <p>(c) List only rows with label 'Apple' and 'pear' using loc.</p>		Color	Count	Price	Apple	Red	3	120	Apple	Green	9	110	Pear	Red	25	125	Pear	Green	26	150	Lime	Green	99	70	3								
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Q.4	a	What is the need of software engineering?	1																																
	b	What is the difference between verification and validation	2																																
	c	What is feasibility study? Explain in detail	2																																
	d	What is difference between water fall model and evolutionary model of s/w engineering	3																																

	e	Describe version control system. Explain utility of version control system	3																																																		
	f	Draw a use-case diagram for a Taxi Booking app	4																																																		
Q.5	a	Write the output of following MYSQL queries: (i) SELECT ROUND(6.5675,2); (ii) SELECT TRUNCATE(5.3456,2); (iii) SELECT DAYOFMONTH(curdate()); (iv) SELECT MID('PRE_BOARD CLASSS 12',4,6);	2																																																		
	b	What do you mean by null value in MYSQL ?	1																																																		
	c	What are two type of HTTP requests? Explain them	2																																																		
	d	Which package must be imported in python to create database connectivity application	2																																																		
	e	Difference between where and having clause	1																																																		
Q.6	a	What is the difference between group by and order by clause of MYSQL ? Give an example of each.																																																			
	b	Consider the following table WORKERS and DESIG. Write SQL commands for the the statements (i) to (iv) and give outputs for SQL queries (v) to (viii). 6																																																			
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		(i) To display W_ID Firstname, Address and city of all employees living in New York from the table WORKERS.																																																			
		(ii) To Display the content of WORKERS table in ascending order of LASTNAME.																																																			

		<p>(iii) To display the Firstname ,Lastname and Total Salary of all Clerks from the tables WORKERS and DESIG , Where Total Salary is calculated as a Salary +Benefits.</p> <p>(iv) To display the Minimum salary among Managers and Clerks from the table DESIG.</p> <p>(v) SELECT FIRSTNAME,SALARY FROM WORKERS,DESIG WHERE DESIGNATION= 'Manager' AND WORKERS.W_ID =DESIGN.W_ID;</p> <p>(vi) SELECT COUNT (DISTINCT DESIGNATION) FROM DESIG;</p> <p>(vii) SELECT DESIGNATION,SUM(SALARY) FROM DESIG GROUP BY DESIGNATION HAVING COUNT(*) < 3;</p> <p>(viii) SELECT SUM(BENEFITS) FROM WORKERS WHERE DESIGNATION = 'Salesman';</p>	
Q.7	a	What is Identity Theft ?	1
	b	What is plagiarism? How can you avoid plagiarism while referring to someone's else's creation?	2
	c	What are the common gender and disability issues faced while teaching / using computers in classrooms?	2
	d	What is computer forensics? What important practices are followed in computer forensics?	2
	e	Describe the following terms (i) Net Neutrality (ii) Crowd sourcing (iii) Smart Mobs	3

KENDRIYA VIDYALAYA SANGATHAN
CLASS XII - INFORMATICS PRACTICES (065)
SESSION ENDING EXAM
MARKING SCHEME (SESSION 2019-20)

TIME ALLOWED : 3 HRS

MM:70

General Instructions:

2. All the questions are compulsory.

SECTION A

Q.1	a	Size of matrix is 2 x 4	1
	b	Used to split an array both in horizontal as well as vertical by providing axis=0,1	1
	c	(i) $\begin{bmatrix} 20 & 30 & 40 \\ 60 & 70 & 80 \end{bmatrix}$ (ii) $\begin{bmatrix} 80 & 70 \\ 120 & 110 \end{bmatrix}$	2
	d	[1,2,3,3,2,1]	2
	e	Ndriya	2
	f	A=range(10,50,12) B=range(90,160,20) Matplotlib.pyplot.plot(a,b) Error :The two sequences being plotted are not of same shape in the given code	2
Q.2.	a	Use the function hist() with histtype=step	2
	b	Pivot() performs when there are multiple entries for a column values for same values for index(row),it leads to error where as pivot_table() pivot the data by aggregating it,thus it can work with duplicate entries	2
	c	Quartiles Q1,Q2 and Q3 are three points that divides a distribution into 4 parts In pandas it is generated with quartile() function	2
	d	(i) <code>pv1=pd.pivot_table(dfN,index=['State'], values=['Sales'],aggfunc=np.sum)</code> (ii) <code>pv1=pd.pivot_table(dfN,index=['Name of Employee'], values=['Sales'], aggfunc=np.sum)</code> (iii) <code>npv1=pd.pivot_table(dfN,index=['Name of Employee','State'],values=['Sales'],aggfunc=np.sum)</code> (iv) <code>pv1=pd.pivot_table(dfN,index=['State'],values=['Sales'], aggfunc=[np.mean,np.min,np.max])</code>	
Q.3.	a	1 mark for each correct difference	2
	b	C=cov(unit_price,no_items) P=correff(unit_price,no_items) 3 marks for correct program	3
	c	Boxplot – definition (1 mark) and example (1 mark) import numpy as np	3

		import matplotlib.pyplot as p1 ar=np.array([78,72,6981,63,675,6, 75, 79,74,71,83,71,79,80,69]) p1.boxplot(ar,showbox=False)	
	d	(a) Data.loc['apple':] (b) Data.loc[:,['color':'price']] (c) Data.loc[['apple','pear']]	3
Q.4	a	Software engineering is an engineering branch associated with software system development. It can be defined as the application of systematic, disciplined, quantified approach to the development, operations, and maintenance of software	1
	B	1 mark for each correct difference	2
	c	1 Marks for definition of feasibility study and 1 marks for explanation	2
	d	In Water Fall model all phases are completed one by one in linear fashion and we get software after completing all the stages whereas in Evolutionary Model we are adding new as suggested by user feedback to already build in and it is waterfall with iterations. Water Fall model works well for smaller projects and projects where requirements are well understood whereas the Evolutionary model is suitable for large projects which can be decomposed into a set of modules for incremental development and delivery.	3
	e	01 Marks for definition of version control system 02 marks for utility	3
	f	1 mark for each correct use case element with role of actor	4
Q.5.	a	Write the output of following MYSQL queries: (i) 6.57 (ii) 5.34 (iii) Day no of curdate (), Ex. If curdate is 05/12/2017 then output is 5 (iv) BOARD	2
	b	01 Marks for correct definition	1
	c	Get request – This request is made to request data from server. Here request send through URL to web server and webserver returns the asked pages in HTML Post Request:-Here HTTP request is made to submit data to be processed to the webserver. Here filled data send to server where is will be processed. Post method carries the data from client to web server	2
	d	Package is mysql.connector	2
	e	Where is used with single row function whereas having is used with group row function.	1
Q.6	a	01 Marks for correct difference and 01 marks for correct example	

	b	<p>(i) SELECT W_ID, Firstname, Address, City FROM workers WHERE City = 'New York';</p> <p>(ii) SELECT * FROM Workers ORDER BY LASTNAME;</p> <p>(iii) SELECT Firstname,Lastname, Salary + Benefits "Total Salary" FROM Workers,Desig WHERE Workers.W_ID = Desig.W_ID AND Designation = 'Clerk';</p> <p>(iv) SELECT Designation, Min(salary) FROM Desig GROUP BY Designation HAVING Designation IN ('Manager','Clerk');</p> <p>(v) Sam 75000 Manilla 70000 George 75000</p> <p>(vi) 4</p> <p>(vii) Director 85000 Salesman 60000</p> <p>(viii) output will be 15000.</p>	
Q.7	a	01 Marks for correct definition	1
	b	01 Marks for correct definition and 01 marks to explain how to avoid plagiarism	2
	c	01 Marks for gender issue 01 marks for correct disability issue	2
	d	01 marks for definition of computer forensics 01 marks for explanation of important practices.	2
	e	01 marks for each correct definition	3

KENDRIYA VIDYALAYA SANGATHAN

SAMPLE QUESTION PAPER (2019-20)

CLASS XII

INFORMATICS PRACTICES NEW (065)

Max Marks: 70

Time: 3 hrs

General Instructions:

- ☒ All questions are compulsory
- ☒ Question Paper is divided into 4 sections A, B, C and D.
- ☒ Section A comprises of questions(1 and 2)
 - (i) Question 1 comprises Data Handling-2(DH-2) (Series, Numpy).
 - (ii) Question 2 comprises of question from Data Handling-2(DH-2)(Data Frames and its operations)
- ☒ Section B comprises of questions from Basic Software Engineering (BSE)
- ☒ Section C comprises of questions from Data Management-2 (DM-2)
- ☒ Section D comprises of questions from Society, Law and Ethics-2(SLE-2)

SECTION A

- Q1 (a) Find the output of following program. 1
- ```
import numpy as np
x=np.array([20,40,60,80,100,120,140,160,180,200])
print(x[:-4])
```
- (b) Fill in the blank with appropriate numpy method to calculate and print the covariance of 1  
an array.
- ```
import numpy as np
a=np.array([1,2,3,4,5])
b=np.array([3,4,0,-1,-3])
print(np._____)
```

- (c) Mr. Shiv wants to plot a scatter chart for the given set of values of subject on x-axis and number of students who opted for that subject on y-axis. 1

Complete the code to perform the following :

(i) To plot the scatter chart in statement 1

(ii) To display the scatter chart in statement 2

```
import matplotlib.pyplot as plt
```

```
x=['Hindi', 'English', 'Math', 'Science', 'SST']
```

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

- (d) Write the output of the following code : 2

```
import numpy as np
```

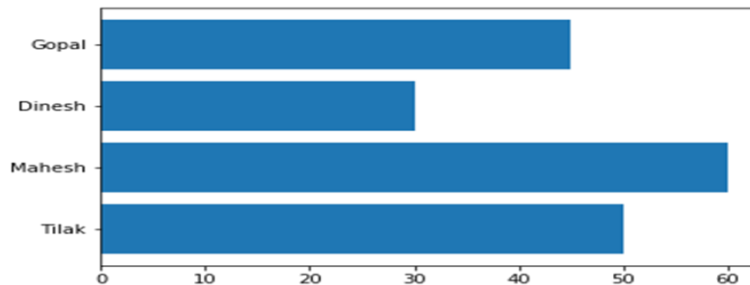
```
x=np.array([1,2,3,4,5])
```

```
y=np.array([[6, 7, 8, 9, 10],
```

```
          [11,12,13,14,15]])
```

```
A = np.vstack([x,y])
```

- (e) Write a code to plot the bar chart as shown in the figure given below: 2



- (f) What is Data Frame? Explain with the help of an example. 2

- (g) Write code to create a numpy array as follows: 3

```
array([[1,2,3],
```

```
      [4,5,6]])
```

and replace all even elements of the array by a random number between 20 and 50.

- Q2 (a) Which method in Pandas calculates the mean absolute deviation of the values for requested axis of a dataframe: 1

(i) rename()

(ii) reindex()

(iii) reframe()

(iv) mad()

- (b) What is the use of pipe() function? 1

- (c) Consider the following python code and write the output: 1

```
import pandas as pd
```

```
import numpy as np
```

```
data = np.array(['a','b','c','d'])
```

```
s = pd.Series(data)
```

```
print(s)
```

- (d) Write python code to transpose a dataframe D. 1
- (e) Make difference between pivot() and pivot_table() function. 2
- (f) Write python code to create a dataframe using following dictionary and sort the dataframe in the descending order of age: 2
- ```
d = {'Name':pd.Series(['Sachin','Dhoni','Virat','Rohit','Shikhar']),
 'Age':pd.Series([26,25,25,24,31]),
 'Score':pd.Series([87,67,89,55,47])}
```
- (g) Consider the following dataframe 3

|   | <u>Age</u> | <u>Name</u> | <u>Score</u> |
|---|------------|-------------|--------------|
| 0 | 26         | Sachin      | 87           |
| 1 | 25         | Dhoni       | 67           |
| 2 | 25         | Virat       | 89           |
| 3 | 24         | Rohit       | 55           |
| 4 | 31         | Shikhar     | 47           |

Write Commands for the following:

1. to compute sum of score.
2. to compute mean of Age.
3. to find maximum score.

- (h) Write the output of following code: 3
- ```
import pandas as pd
import numpy as np
data = np.array([54,76,88,99,34])
s1 = pd.Series(data,index=['a','b','c','d','e'])
s2=s1.rename(index={'a':0,'b':1})
print(s2)
```
- (i) What is Box Plot? Explain and Write code to create a box plot for a list of numbers. 4

SECTION B

- Q3 (a) Which software model enforces sequential software development? 1
- (i) Waterfall
 - (ii) Spiral
 - (iii) Concurrent
 - (iv) None of the above
- (b) Which one is initial phase of software development 1
- (i) Specification
 - (ii) Design/Implementation
 - (iii) Validation/Testing
 - (iv) Evolution

- (c) Write down any one situation when spiral model is suitable. 1
- (d) Write down two advantages of evolutionary model. 2
- (e) What is pair programming? Explain its benefits. 3
- (f) What is Version Control System? Explain its any two features. 3
- (g) Identify various actors in a Taxi Booking app and draw use case diagram for the same. 4

SECTION C

- Q4
- (a) What is Django? 1
 - (b) Name two commands of TCL(Transaction Control Language) 1
 - (c) What is CSV File? 1
 - (d) What is the function of ALTER command? 1
 - (e) What is an SQL result set? 1
 - (f) Make difference between DELETE and DROP command. Explain with suitable examples of each. 3
 - (g) In a database there are two tables 'LOAN' and 'BORROWER' as shown below: 3

LOAN

Loan_Number	Branch_name	Amount
L-170	Downtown	3000
L-230	RedWood	4000

BORROWER

Customer_Name	Loan_number
Jones	L-170
Smith	L-230
Hayes	L-155

- (i) Write Degree and Cardinality of LOAN table.
 - (ii) Identify the Primary Key column in the LOAN table.
 - (iii) How many rows and columns will be there in the natural join of these two tables?
- (h) Write the SQL command for the following on the basis of given table. 4

TABLE NAME : GAME

StudentNo	Classes	Name	Game1	Grade1	Game2	Grade2
10	7	Sammer	Cricket	B	Swimming	A
11	8	Sujit	Tennis	A	Skating	C
12	7	Kamal	Swimming	B	Football	B
13	7	Venna	Tennis	C	Tennis	A
14	9	Archana	Basketball	A	Cricket	A

15	10	Arpit	Cricket	A	Athletics	C
----	----	-------	---------	---	-----------	---

- (1) Display the names of the students who have grade 'A' in either Game1 or Game2 or both.
- (2) Display the number of students having game 'Cricket'.
- (3) Display the names of students who have same game for both Game1 and Game2.
- (4) Display the games taken by the students whose name starts with 'A'.

SECTION D

- | | | | |
|----|-----|--|---|
| Q5 | (a) | What do you understand by 'Intellectual Property Rights'? | 1 |
| | (b) | What is Spam? | 1 |
| | (c) | What is spoofing? | 1 |
| | (d) | What do you understand by e-waste management? Explain | 2 |
| | (e) | Explain Digital Rights Management. How can we protect our content? | 2 |
| | (f) | Write name of open source software: | 3 |
| | | 1. An operating system | |
| | | 2. A Data Base Management System | |
| | | 3. A programming language | |

KENDRIYA VIDYALAYA SANGATHAN

MARKING SCHEME

CLASS XII

INFORMATICS PRACTICES NEW (065)

Q1	(a)	[20 40 60 80 100] (1 mark for correct answer)	1
	(b)	print(np.cov(a,b)) (1 mark for correct answer)	1
	(c)	plt.scatter(x,y) plt.show() (1/2 mark for each correct answer)	1
	(d)	[[1 2 3 4 5] [6 7 8 9 10] [11 12 13 14 15]] (2mark for correct answer)	2
	(e)	import matplotlib.pyplot as plt st = ['Tilak','Mahesh','Dinesh','Gopal'] marks = [50,60,30,45] plt.barh(st.marks) (2 mark for correct answer)	2
	(f)	DataFrame is a 2-dimensional labeled data structure with columns of potentially different types. It is like a spreadsheet or SQL table, or a dict of Series objects. It is generally the most commonly used pandas object. Like Series, DataFrame accepts many different kinds of input. Example import pandas as pd d = {'one': [1., 2., 3., 4.], 'two': [4., 3., 2., 1.]} pd.DataFrame(d) (1 mark for definition and 1 mark for correct example)	2
	(g)	import numpy as np array1=np.array([[1,2,3], [4,5,6]]) print(array1) x=np.where(array1%2==0) for i in x: array1[x]=np.random.randint(low=20,high=50) (1 mark for creating array and 2 marks for code to replace)	3
Q2	(a)	(iv) mad()	1

		(1 mark for correct answer)	
	(b)	The pipe() function is used to change the functions in the order they are executed. (1 mark for correct answer)	1
	(c)	0 a 1 b 2 c 3 d dtype: object (1 mark for correct answer)	1
	(d)	D.T	1
	(e)	Pivot_table is a generalization of pivot, which allows you to aggregate multiple values with the same destination in the pivoted table. (2 mark for correct answer)	2
	(f)	df= pd.DataFrame(d) df=df.sort_values(by=['Age'],ascending=[False]) (1 mark for creating and 2 marks for rest of the code)	2
	(g)	1. df[['Score']].sum() 2. df[['Age']].mean() 3. df[['Score']].max() (1 mark for each correct command)	3
	(h)	0 54 1 76 c 88 d 99 e 34 dtype: int32 (3 marks for correct output)	3
	(i)	A Box Plot is the visual representation of the statistical five number summary of a given data set. A Five Number Summary includes: •Minimum •First Quartile •Median (Second Quartile) •Third Quartile •Maximum Example value1 = [72,76,24,40,57,62,75,78,31,32] import matplotlib.pyplot as plt A1 = [72,76,24,40,57,62,75,78,31,32] box=plt.boxplot(A1) plt.show() (2 marks for explanation and 2 marks for code)	4
Q3	(a)	(i) Waterfall (1 mark for correct answer)	1

	(b)	(i) Specification (1 mark for correct answer)	1
	(c)	When risk assessment is very critical (1 mark for correct answer)	1
	(d)	Error Reduction: because versions are tested at each incremental cycle User satisfaction: Users are given full chance of experimenting partially (1 mark for each correct advantage)	2
	(e)	Pair Programming: Pair Programming is agile method, where two programmers share a single workstation/computer. One programmer is called driver and other is called navigator. Benefits of Pair Programming: <ul style="list-style-type: none"> •Increased software Quality •User Satisfaction •Easy Integration of components •Mentoring & Learning by programmers •Flexibility in development (1 mark for correct explanation and 2 marks for benefits)	3
	(f)	Version Control System(VCS) can be considered as a kind of database. It helps us to save a snapshot of the complete project at any point of time. (1 mark for correct explanation and 1 marks for each feature)	3
	(g)	1 mark for identification of actors , 2 marks for correct diagram and 1 mark for correct labels	4
Q4	(a)	Django is an open source web application development framework.	1
	(b)	Commit, Rollback (1 mark for correct answer)	1
	(c)	CSV (Comma Separated Values) is a simple file format used to store tabular data, such as a spreadsheet or database. (1 mark for correct answer)	1
	(d)	Alter command is used to change/modify the structure of database object like a table, index, etc. (1 mark for correct answer)	1
	(e)	An SQL result set is a set of rows from a database, as well as metadata about the query such as the column names, and the types and sizes of each column. (1 mark for correct answer)	1
	(f)	1 mark for explanation and 2 marks for examples)	3
	(g)	(i) Degree: 3 Cardinality: 2 (ii) Loan_Number (iii) Rows: 6 Columns: 5	3

		(1 mark for each correct answer)	
	(h)	<ol style="list-style-type: none"> 1. Select Name from GAME where Grade1 = 'A' or Grade2 = 'A'; 2. Select Count(*) from GAME where Game1 = 'Cricket or Game2 = 'Cricket'; 3. Select Name from GAME where Game1 = Game 2; 4. Select Name, Game1, Game 2 from GAME where Name Like "A%"; <p>(1 mark for each correct answer)</p>	4
Q5	(a)	<p>Intellectual property rights are the rights given to people for the original creations of their minds. They usually give the creator an exclusive rights over the use of his/her creation for a certain period of time.</p> <p>(1 mark for correct answer)</p>	1
	(b)	<p>Spam are unwanted e-mail which are business related and sent to the e-mail account in bulk.</p> <p>(1 mark for correct answer)</p>	1
	(c)	<p>Spoofing enables the junk e-mail to hide his or her identity from the recipient spoofing the sender places a false return address on the junk message.</p> <p>(1 mark for correct answer)</p>	1
	(d)	(1 mark for definition and 1 mark for explanation)	2
	(e)	(1 mark for defining and 1 mark for explanation of content protection)	2
	(f)	<ol style="list-style-type: none"> 1. UBUTU 2. Mysql 3. JAVA <p>(1 mark for each correct answer)</p>	3

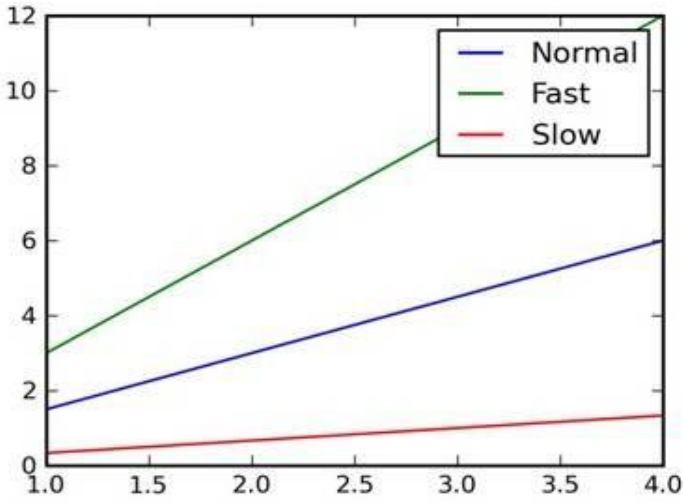
Max Marks: 70

Time: 3 hrs

General Instructions:

- All questions are compulsory
- Question Paper is divided into 4 sections A,B,C and D.
- Section A comprises of questions(1 and 2)
 - (i) Question 1 comprises Data Handling-2(DH-2)(Series,Numpy)
 - (ii) Question 2 comprises of question from Data Handling -2(DH-2)(Data Frames and its operations)
- Section B comprises of questions from Basic Software Engineering.
- Section C comprises of questions from Data Management-2(DM-2)
- Section C comprises of questions from Society, Law and Ethics-2(SLE-2)

Section A			
Answer the following questions :			
1	a)	Find the output of following program. import numpy as np d=np.array([10,20,30,40,50,60,70]) print(d[-4:])	1
	b)	Fill in the blank with appropriate numpy method to calculate and print the variance of an array. import numpy as np data=np.array([1,2,3,4,5,6]) print(np. _____ (data,ddof=0)	1
	c)	Mr. Sanjay wants to plot a bar graph for the given set of values of subject on x-axis and number of students who opted for that subject on y-axis. Complete the code to perform the following : (i) To plot the bar graph in statement 1 (ii) To display the graph in statement 2 import matplotlib.pyplot as plt x=['Hindi', 'English', 'Science', 'SST'] y=[10,20,30,40] _____ Statement 1 _____ Statement 2	1

	<p style="text-align: center;">OR</p> <p>Mr. Harry wants to draw a line chart using a list of elements named LIST. Complete the code to perform the following operations:</p> <p>(i) To plot a line chart using the given LIST, (ii) To give a y-axis label to the line chart named "Sample Numbers".</p> <pre>import matplotlib.pyplot as PLINE LIST=[10,20,30,40,50,60] _____ Statement 1 _____ Statement 2 PLINE.show()</pre>	
d)	<p>Write the output of the following code :</p> <pre>import numpy as np array1=np.array([10,12,14,16,18,20,22]) array2=np.array([10,12,15,16,12,20,12]) a=(np.where(array1==array2)) print(array1[a])</pre>	2
e)	<p>Write a code to plot the speed of a passenger train as shown in the figure given below:</p> 	2
f)	<p>What is series? Explain with the help of an example.</p>	2
g)	<p>Write a NumPy program to create a 3x3 identity matrix, i.e. diagonal elements are 1, the rest are 0. Replace all 0 to random number from 10 to 20</p> <p style="text-align: center;">OR</p> <p>Write a NumPy program to create a 3x3 identity matrix, i.e. non diagonal elements are 1, the rest are 0. Replace all 0 to random number from 1 to 10</p>	3

Answer the following questions			
2	a)	<p>_____ method in Pandas can be used to change the index of rows and columns of a Series or Dataframe :</p> <p>(i) rename() (ii) reindex() (iii) reframe() (iv) none of the above</p>	1
	b)	<p>Hitesh wants to display the last four rows of the dataframe df and has written the following code :</p> <p>df.tail()</p> <p>But last 5 rows are being displayed. Identify the error and rewrite the correct code so that last 4 rows get displayed.</p> <p style="text-align: center;">OR</p> <p>Write the command using Insert() function to add a new column in the last place(3rd place) named "Salary" from the list Sal=[10000,15000,20000] in an existing dataframe named EMP already having 2 columns.</p>	1
	c)	<p>Consider the following python code and write the output for statement S1</p> <p>import pandas as pd K=pd.series([2,4,6,8,10,12,14]) K.quantile([0.50,0.75]) S1</p>	1
	d)	<p>Write a small python code to drop a row from dataframe labeled as 0.</p>	1
	e)	<p>What is Pivoting? Name any two functions of Pandas which support pivoting.</p>	2
	f)	<p>Write a python code to create a dataframe with appropriate headings from the list given below :</p> <p>['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82]</p> <p style="text-align: center;">OR</p> <p>Write a small python code to create a dataframe with headings(a and b) from the list given below :</p> <p>[[1,2],[3,4],[5,6],[7,8]]</p>	2
	g)	<p>Consider the following dataframe, and answer the questions given below:</p> <pre>import pandas as pd df = pd.DataFrame({"Quarter1": [2000, 4000, 5000, 4400, 10000], "Quarter2": [5800, 2500, 5400, 3000, 2900], "Quarter3": [20000, 16000, 7000, 3600, 8200], "Quarter4": [1400, 3700, 1700, 2000, 6000]})</pre> <p>(i) Write the code to find mean value from above dataframe df over the index and column axis. (Skip NaN value)</p> <p>(ii) Use sum() function to find the sum of all the values over the index axis.</p> <p>(iii) Find the median of the dataframe df.</p>	3

OR

Given a data frame **df1** as shown below:

City	Maxtemp	MinTemp	RainFall
Delhi	40	32	24.1
Bengaluru	31	25	36.2
Chennai	35	27	40.8
Mumbai	29	21	35.2
Kolkata	39	23	41.8

- (i) Write command to compute sum of every column of the data frame.
- (ii) Write command to compute mean of column Rainfall.
- (iii) Write command to compute average maxTemp, Rainfall for first 5 rows

h) Find the output of the following code:

```
import pandas as pd
data = [{'a': 10, 'b': 20}, {'a': 6, 'b': 32, 'c': 22}]
#with two column indices, values same as dictionary keys
df1 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b']) #With two column indices
with one index with other name
df2 = pd.DataFrame(data, index=['first', 'second'], columns=['a', 'b1']) print(df1)
print(df2)
```

i) Write the code in pandas to create the following dataframes :

```
df1          df2
mark1 mark2mark1 mark2
0  10  150  30  20
1  40  45      1  20  25
2  15  302  20  30
3  40  703  50  30
```

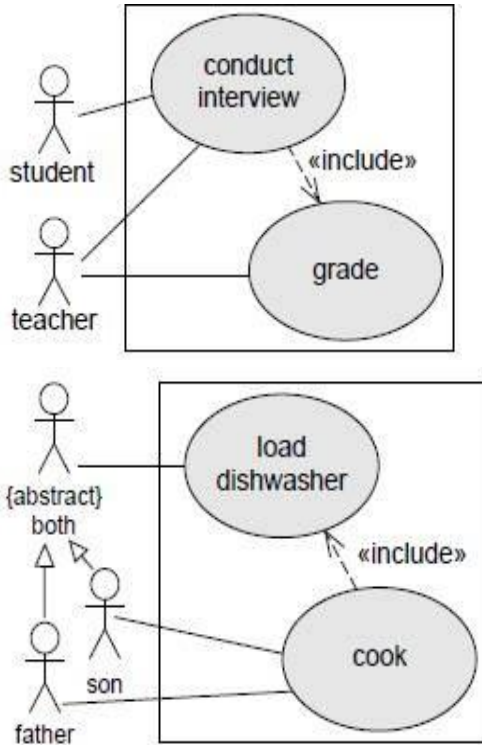
Write the commands to do the following operations on the dataframes given above :

- (i) To add dataframes df1 and df2.
- (ii) To subtract df2 from df1
- (iii) To rename column mark1 as marks1 in both the dataframes df1 and df2.
- (iv) To change index label of df1 from 0 to zero and from 1 to one.

Section B			
3	a)	Which software model is best suitable for client server application? (i) Waterfall (ii) Spiral (iii) Concurrent (iv) None of the above	1
	b)	_____ is the process of checking the developed software for its correctness and error free working (i) Specification (ii) Design/Implementation (iii) Validation/Testing (iv) Evolution	1
	c)	Write down any one benefit of pair programming.	1
	d)	In the Scrum process, a ScrumMaster differs from a traditional project manager. Justify the statement. OR List any two differences between Incremental model and Spiral model in developing complex software projects.	2
	e)	Write down any one situation where waterfall software process can be used. Also mention one advantage and one disadvantage of waterfall software process. OR Write down any one situation where spiral delivery model can be used. Also mention one advantage and one disadvantage of spiral delivery model.	3
	f)	Gunveen, Marshy and Aloha are three developers working on an exciting new app, and the launch day is just a day away. Gunveen creates an unmanaged package and saves it Aloha's folder. Marshy also writes a new piece of code and saves it in Aloha's folder. What could go wrong on the day of the launch? Explain and also mention how version control can help teams in this scenario.	3
	g)	Draw a use case diagram and identify the actors for the situations (i) do (ii) as directed: (i) A repair can be made by a master, a trainee or any other repair shop employee. (ii) Consider an ATM system. Identify at least three different actors that interact with this system.	4

OR

(i) Look at the following use case diagrams and write the actors and the situation depicted by the use case diagrams :



(ii) Look at the use case diagram shown below and explain the relationship depicted between A and B

Section C

4	a)	Write the Django command to start a new app named 'users' in an existing project?	1
	b)	What is the use of COMMIT in sql ? <p align="center">OR</p> What is the function of ALTER command?	1
	c)	CSV stands for _____	1
	d)	NULL value means : (i) 0 value (ii) 1 value (iii) None value (iv) None of the above	1

e)	<p>is_connected() is the MYSQL function to :</p> <p>(i) establish a connection to a mysql database from python. (ii) verify whether the python application is connected to mysql database. (iii) traverse through records in mysql database. (iv) None of the above</p>	1
f)	<p>Shewani has recently started working in MySQL. Help her in understanding the difference between the following :</p> <p>(i) Where and having clause (ii) Count(column_name) and count(*)</p>	3
g)	<p>On the basis of following table answer the given questions:</p> <p style="text-align: center;">Table: CUSTOMER_DETAILS</p> <pre> +-----+-----+-----+-----+-----+-----+ Cust_ID Cust_Name Acct_Type Accumlt_Amt DOJ Gender +-----+-----+-----+-----+-----+-----+ CNR_001 Manoj Saving 101250 1992-02-19 M CNR_002 Rahul Current 132250 1998-01-11 M CNR_004 Steve Saving 18200 1998-02-21 M CNR_005 Manpreet Current NULL 1994-02-19 M +-----+-----+-----+-----+-----+-----+ </pre> <p>(i) Write the degree and cardinality of the above table. (ii) What will be the output of the following query : Select max(DOJ) From Customer_Details; (iii) Write the sql query to delete the row from the table where customer has no accumulated amount.</p>	3
h)	<p>Write commands in SQL for (i) to (iv) and output for (v) and (vi).</p> <p style="text-align: center;">Table : Store</p> <pre> +-----+-----+-----+-----+-----+-----+-----+ StoreId Name Location City NoOfEmp DateOpen SalesAmt +-----+-----+-----+-----+-----+-----+-----+ S101 Planet Fashion Bandra Mumbai 7 2015-10-16 40000 S102 Vogue Karol Bagh Delhi 8 2015-07-14 120000 S103 Trends Powai Mumbai 10 2015-06-24 30000 S104 SuperFashion Thane Mumbai 11 2015-02-06 45000 S105 Annabelle South Extn. Delhi 8 2015-04-09 60000 S106 Rage Defence Colony Delhi 5 2015-03-01 20000 +-----+-----+-----+-----+-----+-----+-----+ </pre> <p>(i) To display names of stores along with SalesAmount of those stores that have 'fashion' anywhere in their store names. (ii) To display Stores names, Location and DateOfOpen of stores that were opened before 1st March, 2015. (iii) To display name and location of those store which have either 'u' as second character in their name. (iv) To display the City and the number of stores located in that City, only if number of stores is more than 2. (v) Select Min(DateOpen) from Store; (vi) Select Count(Storeid), Noofemp From Store Group By Noofemp Having Max(Salesamt)<60000;</p>	4

		OR	
		(i) In a school, a database named “ school ” is created in mysql whose password is “ cbse ”. Smith is trying to add a new record of a student having details(3, 'Michelle', 'Agartala') in a “ student ” table. (ii) Write the code in python to read the contents of “number.csv” file consisting of data from a mysql table and print the data of the table on the screen in tabular form of the table.	
Section D			
5	a)	Which of the following is not an intellectual property? (i) A poem written by a poet (ii) An original painting made by a painter (iii) Trademark of a Company (iv) A remixed song	1
	b)	Jhilmalini has stolen a credit card. She used that credit card to purchase a laptop. What type of offence has she committed?	1
	c)	Name the primary law in India dealing with cybercrime and electronic commerce.	1
	d)	Sutapa received an email from her bank stating that there is a problem with her account. The email provides instructions and a link, by clicking on which she can logon to her account and fix the problem. Help Sutapa by telling her the precautions she should take when she receives these type of emails.	2
	e)	Explain any two ways in which technology can help students with disabilities.	2
	f)	Explain the role of online social media campaigns, crowdsourcing and smart mobs in society. OR Ms Samtha has many electronics gadgets which are not usable due to outdated hardware and software. Help her to find any three best ways to dispose the used electronic gadgets.	3

CLASS XII
INFORMATICS PRACTICES - New (065)
Marking Scheme - SQP (2019-20)

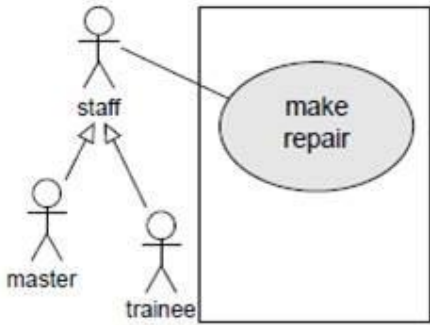
Max. Marks: 70

Time: 3 hrs

Section A			
Q1	a) Ans	[40 50 60 70]	(1 mark for correct output)
	b) Ans	print(np.var (data,ddof=0))	(1 mark for appropriate function var)
	c)Ans	(i) plt.bar(x,y) (ii) plt.show() OR (i) PLINE.plot(LIST) (ii) PLINE.ylabel("Sample Numbers")	(½ mark for each correct code)
	d) Ans	[10 12 16 20]	(1 mark for correct output)
	e) Ans	import matplotlib.pyplot as plt import numpy as np x = np.arange(1, 5) plt.plot(x, x*1.5, label='Normal') plt.plot(x, x*3.0, label='Fast') plt.plot(x, x/3.0, label='Slow') plt.legend() plt.show()	2 marks (½ mark for each import statement) (½ mark for using arange()) (½ mark for using plot(), legend() and show())
	f) Ans	Pandas Series is a one-dimensional labeled array capable of holding data of any type (integer, string, float, python objects, etc.). The axis labels are collectively called index.Example importpandas as pd # simple array data =pd.series([1,2,3,4,5]) print data	2 marks (1 mark for definition and 1 mark for example)
	g) Ans	import numpy as np array1=np.identity(3) print(array1) x=np.where(array1==0) for i in x: array1[x]=np.random.randint(low=10,high=20) print(array1)	3 marks 1 mark for creation of identity matrix 1 mark for identification of position of 0 1 mark for changing value of 0 to random number

		OR	1 mark for creation of matrix 1 mark for identification of even number 1 mark for changing value of 0 to random number
		<pre>import numpy as np Z = np.arange(9).reshape(3,3) print (Z) x=np.where((Z%2)==0) for i in x: Z[x]=np.random.randint(low=10,high=20) print(Z)</pre>	
Q2	a) Ans	(ii) reindex	(1 mark for correct answer)
	b) Ans	df.tail(4)	(1 mark for correct answer)
		OR	
		EMP.insert(loc=3,column="Salary",value=Sal)	
	c) Ans	0.50 8.0 0.75 11.0	(1 mark for each correct line of output)
	d) Ans	# Drop rows with label 0 df = df.drop(0) print(df)	(1 mark for giving complete and correct code)
	e) Ans	Pivoting means to use unique values from specified index/columns to form apex of the resulting dataframe. Pivot() and pivot_table() methods	(1 mark for correct definition and ½ mark for each correct example)
	f) Ans	<pre>import pandas as pd # initialize list of lists data = [['S101', 'Amy', 70], ['S102', 'Bandhi', 69], ['S104', 'Cathy', 75], ['S105', 'Gundaho', 82]] # Create the pandas DataFrame df = pd.DataFrame(data, columns = ['ID', 'Name', 'Marks']) # printdataframe. print(df)</pre> <p style="text-align: center;">OR</p> <pre>import pandas as pd df = pd.DataFrame([[1, 2], [3, 4]], columns = ['a','b']) df2 = pd.DataFrame([[5, 6], [7, 8]], columns = ['a','b']) df = df.append(df2)</pre>	2 marks (½ mark for correct initialization, 1 mark for correct dataframe and ½ mark for printing dataframe)
	g)Ans	(i) print(df.mean(axis = 1, skipna = True)) print(df.mean(axis = 0, skipna = True)) (ii) print(df.sum(axis = 1, skipna = True)) (iii) print(df.median())	3 marks (1 mark for each correct code)

		OR	
		(i) df1.sum() (ii) df1['Rainfall'].mean() (iii) df1.loc[:11, 'maxtemp':'Rainfall'].mean()	
	h)Ans	a b first 10 20 second 6 32 a b1 first 10 NaN second 6 NaN	3 marks (½ mark for each correct output)
	i)Ans	import numpy as np import pandas as pd df1 = pd.DataFrame({'mark1':[30,40,15,40], 'mark2':[20,45,30,70]}); df2 = pd.DataFrame({'mark1':[10,20,20,50], 'mark2':[15,25,30,30]}); print(df1) print(df2) (i) print(df1.add(df2)) (ii) print(df1.subtract(df2)) (iii) df1.rename(columns={'mark1':'marks 1'}, inplace=True) print(df1) (iv) df1.rename(index = {0: "zero", 1:"one"}, inplace = True) print(df1)	4 marks (1 mark for creating each dataframe and ½ mark for each correct command)
Section B			
Q3	a)Ans	Concurrent Process model	(1 mark for correct answer)
	b)Ans	Validation/Testing	(1 mark for correct answer)
	c)Ans	Improved code quality: As second partner reviews the code simultaneously, it reduces the chances of mistake.	(1 mark for correct answer)
	d)Ans	→ The ScrumMaster is the servant leader to the Product Owner, Development Team and Organization with no hierarchical authority over the team but rather more of a facilitator, the ScrumMaster ensures that the team adheres to Scrum theory, practices, and rules. →The ScrumMaster protects the team by doing anything possible to help the team perform at the highest level. OR →Incremental model works on the stage-wise development of a complex project that involves real time data whereas Spiral model works on risk analysis of a real time situation. →Spiral model is a combination of both Incremental as well as Waterfall method.	2 marks (1 mark for correct answer and 1 mark for correct justification)

e)Ans	<p>Situations to use/apply waterfall model</p> <ul style="list-style-type: none"> i) When project is small ii) When problem is static. iii) Clear and fixed requirements. Stable problem definition. Technology is static. <p>Advantage : Simple and easy to understand</p> <p>Disadvantage : No working software till the last phase</p> <p>OR</p> <p>Situations to use/apply spiral model When project is large, When releases are required to be frequent, When risk and costs evaluation is important For medium to high-risk projects</p> <p>Advantage- Additional functionality or changes can be done at a later stage Cost estimation becomes easy as the prototype building is done in small fragments</p> <p>Disadvantage- Risk of not meeting</p>	<p>3 marks</p> <p>(1 mark for any correct area of use 1 mark for correct advantage and 1 mark for correct disadvantage)</p>
f)Ans	<p>→The team members are not working in a systematic way and they are not saving the versions of their work. Changes made in one part of the software can be incompatible with those made by another developer working at the same time.</p> <p>→Version control exists to solve these problems, and it's within easy reach for every developer. Version control helps teams solve these kinds of problems, tracking every individual change by each contributor and helping prevent concurrent work from conflicting.</p> <p>→Further, in all software development, any change can introduce new bugs on its own and new software can't be trusted until it's tested. So testing and development proceed together until a new version is ready.</p>	<p>3 marks</p> <p>(1 mark for identifying the problem, 1 mark for explaining version control and 1 mark for its advantages)</p>
g)Ans	 <p>Actors : Master, Trainee An actor is any entity (user or system) that interacts with the</p>	<p>4 marks</p> <p>(2 marks for drawing use case and 1 mark for each actor)</p>

		<p>system of interest. For an ATM, this includes:</p> <ul style="list-style-type: none"> • Bank Customer • ATM Maintainer • Central Bank Computer <p style="text-align: center;">OR</p> <p>A teacher is conducting an interview with a student. In the course of that, the teacher always has to grade the student. Father and son cook dinner. In the course of that, one of them always has to load the dishwasher.</p> <ol style="list-style-type: none"> 1. B can execute the same use cases as A. 2. B inherits all of A's associations. 	(1½ mark for each correct explanation and 1 mark explaining the relationship)
Section C			
Q4	a)Ans	python manage.py startapp users	(1 mark for correct answer)
	b)Ans	<p>Commit is used to save all the DML transactions, and once saved they cannot be rolled back.</p> <p style="text-align: center;">OR</p> <p>Alter command is used to change/modify the structure of database object like a table, index, etc.</p>	(1 mark for correct answer)
	c)Ans	Comma separated values	(1 mark for correct answer)
	d)Ans	None value	(1 mark for correct answer)
	e)Ans	verify whether the python application is connected to mysql database.	(1 mark for correct answer)
	f)Ans	<p>(i) Where clause is used to show data set for a table based on a condition and having clause is used to put condition on the result set that comes after using Groupby clause.</p> <p>(ii) COUNT(*) returns the number of items in a group, including NULL values and duplicates. COUNT(expression) evaluates expression for each row in a group and returns the number of non null values.</p> <p>Candidate Key – A Candidate Key can be any column or a combination of columns that can qualify as unique key in database. There can be multiple Candidate Keys in one table. Each Candidate Key can qualify as Primary Key.</p> <p>Primary Key – A Primary Key is a column or a combination of columns that uniquely identify a record. Only one Candidate Key can be Primary Key.</p> <p>A table can have multiple Candidate Keys that are unique as single column or combined multiple columns to the table. They are all candidates for Primary Key.</p>	<p style="text-align: center;">3 marks</p> <p>(1 mark for each correct difference)</p>
	g)Ans		3 marks

		<p>(i) The degree is 6 and cardinality is 5.</p> <p>(ii)</p> <pre>+-----+ max(DOJ) +-----+ 1998-02-21 +-----+</pre> <p>(iii)Delete from Customer_Details where Accumlt_Amt is NULL;</p>	<p>(½ mark for correct degree and ½ mark for cardinality)</p> <p>(1 mark for correct output)</p> <p>(1 mark for correct query)</p>
h)Ans		<pre>mysql> Select Name,SalesAmt from Store order by noOfEmp; mysql> Select city, sum(SalesAmt) from store group by City; mysql> Select count(*),City from store group by City having count(*)>2; mysql> Select Min(DateOpen) from Store;</pre> <pre>+-----+ Min(DateOpen) +-----+ 2015-02-06 +-----+</pre> <pre>mysql> Select Count(StoreId), NoOfEmp from Store group by NoOfemp having max(SalesAmt)<60000;</pre> <pre>+-----+-----+ Count(StoreId) NoOfEmp +-----+-----+ 1 10 1 11 1 5 1 7 +-----+-----+</pre> <p style="text-align: center;">OR</p> <pre>i)import mysql.connector mydb = mysql.connector.connect(host="localhost", user="root", passwd="cbse", database="school") mycursor = mydb.cursor() mycursor.execute("INSERT INTO student values(3,'Michelle', 'Agartala');") mydb.commit()</pre> <pre>ii) f = open('numbers.csv', 'r') with f: reader = csv.reader(f) for row in reader: for e in row: print(e)</pre>	<p>4 marks</p> <p>(1 mark for each correct query and ½ mark for each correct output)</p> <p>(i) 1 mark for correct connection establishment ½ mark for activation of cursor and ½ mark for correct executable insert command Or 2 full marks for any other correct program</p> <p>(ii) (1 mark for correct opening of csv file in read mode, ½ mark for csv.reader() command and ½ mark for printing content of csv file)</p>

