GRADE: XII	DURATION: 3Hrs.
SUBJECT: COMPUTER SCIENCE	TOTAL MARKS: 70

GENERAL INSTRUCTIONS:
- All questions are compulsory.
- Question paper is divided into 4 sections A, B, C and D.
  - Section A : Unit-1
  - Section B : Unit-2
  - Section C : Unit- 3
  - Section D : Unit-4

SECTION - A

1. a) Which of the following can be used as valid variable identifier(s) in Python?
     (i) 4thSum   (ii) Total   (iii) Number# (iv)   Data   1

    b) Which of the following are not a valid arithmetic operators in Python:
     (i)   //   (ii) **   (iii) <   (iv) and   1

    c) Name the Python library modules which need to be imported to invoke the following function.
     (i) floor()   (ii) random()   1

    d) Rewrite the following program after removing the syntactical errors (if any). Underline each correction.   2
```
    DEF execmain():
            x = input("Enter a number:")
            if (abs(x)=x):
                    print "You entered a positive number"
             else:
                    x=*-1
                    print "Number made positive:"x
    execmain()
```

    e)   Find and write the output of the following program: 2
```
     def main ( ) :
            Moves=[11, 22, 33, 44]
            Queen=Moves
            Moves[2]+=22
            L=Len(Moves)
            for i in range (L)
                    print ("Now@", Queen[L-i-1], "#", Moves [i])
```

f) Find and write the output of the following program: 3

```python
def ChangeList():
    L=[]
    L1=[]
    L2=[]
    for i in range(1,10):
        L.append(i)
    for i in range(10,1,–2):
        L1.append(i)
    for i in range(len(L1)):
        L2.append(L1[i]+L[i])
    L2.append(len(L)-len(L1))
    print(L2)
ChangeList()
```

g) What are the possible outcome(s) expected from the following Python code? Also specify
maximum and minimum value of Y.   2

```python
import random
X= random.random()
Y= random.randint(0,4)
print(int(X),":",Y+int(X))
```

   (i) 0 : 0   (ii) 1 : 6   (iii) 2 :4   (iv) 0 :3

2. a) List one similarity and one difference between List and Dictionary data type.   1

   b) Which is the correct form of declaration of list?   1
      (i) Number = [1;'one',2;'two',3;'three']
      (ii) Number = (1:'one',2:'two',3:'three')
      (iii) Number = [1, 'one, 2,'two',3,'three']
      (iv) Number = {1,'one',2,'two',3,'three'}

   c) Identify the valid declaration of Day :   1
          Day={1:'monday',2:'tuesday',3:'wednesday'}
      (i) list   (ii) dictionary   (iii) array   (iv) tuple

   d) Find and write the output of the following Python code: 1
```python
x = "abcdef"
i = "a"
while i in x:
    print(i, end = " ")
```

   e) Find the output of following: 1
```python
colors = ["violet", "indigo", "blue", "green", "yellow", "orange", "red"]
del color[4]
colors.remove("blue")
colors.pop(3)
print(colors)
```

f) What do you understand by the term tuple? Give example. 2

g) Write definition of a Method MSEARCH(STATES) to display all the state names from a list of STATES, which are starting with alphabet M. For example: If the list STATES contains ["MP","UP","WB","TN","MH","MZ","DL","BH","RJ","HR"]
The following should get displayed.

   MP   MH   MZ 3

<div align="center">OR</div>

Write a method/function **COUNTWORDS( )** in Python to read lines from a text file TEXT.TXT and display the total number of words present in the file.

h) A bar chart is drawn (using pyplot) to represent sales data of various models of cars, for a month. Write appropriate statements in Python to provide labels Month - June and Sale done to x and y axis respectively. 3

<div align="center">OR</div>

Give the output of the following Python code:

```
import matplotlib.pyplot as plt; plt.rcdefaults()
import numpy as np
import matplotlib.pyplot as plt
objects = ('Python', 'C++', 'Java', 'Perl', 'Scala', 'Lisp')
y_pos = np.arange(len(objects))
performance = [10,8,6,4,2,1]
plt.bar(y_pos, performance, align='center', alpha=0.5)
plt.xticks(y_pos, objects)
plt.ylabel('Usage')
plt.title('Programming language usage')
plt.show( )
```

i) Write a Recursive function in Python **BinarySearch(Arr,l,R,X)** to search the given element X to be searched from the list Arr having R elements,where l represents lower bound and R represents the upper bound. 3

<div align="center">OR</div>

Write a Recursive function **recurpalin(n)** in Python to check and return the given text **n** is palindrome or not, where **n** is the text passed to the parameter.

j) Write a function in Python, **InsertQ(Arr,data)** and **DeleteQ(Arr)** for performing insertion and deletion operations in a Queue. **Arr** is the list used for implementing queue and **data** is the value to be inserted. 4
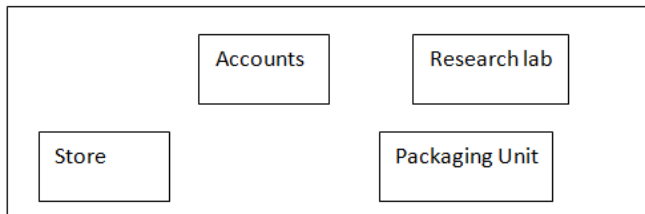
<div align="center">OR</div>

Write a function in Python, **StkPush(Package)** and **StkPop(Package)** to add a new Package and delete a Package from a List of Package Description, considering them to act as push and pop operations of the Stack data structure.

SECTION - B

3. Questions 3 (a) to 3 (c) : Fill in the blanks
   a) _____ is a network that covers geographic area that are larger, such as districts or cities.   1

   b) _____ computing refers to applications and services that run on a distributed network
      using virtualized resources.   1

   c) A _____ is a set of rules that governs data communication.   1

   d) A _____ is a device that forwards packets between networks by processing the routing
      information included in the packet.   1

   e) Expand the following:
                 i. MAC   ii. DNS   iii. SSH   iv. URL   2

   f) Write difference between IPv4 and IPv6.   2

   g) Write the purpose of following commands.   3
         i) whois
         ii) ipconfig
         iii) nslookup

   h) Riana Medicos Centre has set up its new centre in Riyadh. It has four buildings as shown in
      the diagram given below: 4

Distances between various buildings are as follows:

Accounts to Research Lab	5 m
Accounts to Store	50 m
Store to Packaging Unit	60 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	25 m
Store to Research Lab	80 m

Number of computers:

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

As a network expert, provide the best possible answer for the following queries:
i) Suggest the type of network established between the buildings.
ii) Suggest the most suitable place (i.e., building) to house the server of this organization.
iii) Suggest the placement of the following devices with justification:
   (a) Repeater   (b) Hub/Switch.
iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

SECTION – C

4. a) Which keyword is used to sort the records of a table in ascending order?   1

   b) Which command is used to modify the column of the table?   1

   c) Which clause is used to remove the duplicating rows of the table?   1

   d) Which keyword is used to rename the field name?   1

   e) Differentiate between Primary key and Alternate key.   2
                              OR
      Differentiate between attribute and tuple.

   f) Differentiate between Django GET and POST method.   2

   g) Write an output for SQL queries (i) to (iii), which are based on the tables given below: 3

Table : **STUDENT**

ID	NAME	AGE	CITY	FEE	PHONE
P1	SAMEER	34	DELHI	45000	9811076656
P2	ARYAN	35	MUMBAI	54000	9911343989
P4	RAM	34	CHENNAI	45000	9810593578
P6	PREMLATA	36	BHOPAL	60000	9910139987
P7	SHIKHA	36	INDORE	34000	9912139456
P8	RADHA	33	DELHI	23000	8110668888

   i) SELECT COUNT(*), City FROM STUDENT GROUP BY CITY HAVING COUNT(*)>1;
   (ii) SELECT MAX(FEE),MIN(FEE) FROM STUDENT;
   (iii) SELECT NAME, AGE FROM STUDENT WHERE CITY="Delhi";

h) Write SQL queries for (i) to (iv), which are based on the tables given in the question 4(g): 4

  (i) To display the records from table STUDENT in alphabetical order as per the name of the student.
  (ii) To display ID, Name and City whose Age is between 30 and 35.
  (iii) To display Name, Fee and total number of students city wise.
  (iv) To increase Fee of all students by 2000 whose City is "MUMBAI".

SECTION – D

5) a) What are the proper methods and steps for the disposal of used electronic items? 1

   b) Explain the gender and disability issues while using computers in the classroom. 1

   c) How can we recycle e-waste safely? 2

   d) What are Intellectual Property Rights (IPR)? 2

   e) Write any two categories of cybercrime. 2

   f) Define and name some open source software. 2