

Sample Question Paper – Set II

Computer Science (083)

Class- XII (2015-16)

Time: 3hrs

M.M: 70

Instructions:

- i. All Questions are Compulsory.
- ii. Programming Language: Section A : C++
- iii. Programming Language: Section B: Python
- iv. Answer either Section A or B, and Section C is compulsory

Section : A (C++)

Q1 a. Define Macro with suitable example. 2

b. Which C++ header file (s) will be included to run /execute the following C++ code? 1

```
void main( )
{
    int Last =26.5698742658;
    cout<<setw(5)<<setprecision(9)<<Last;
}
```

c. Rewrite the following program after removing any syntactical errors. Underline each correction made. 2

```
#include<iostream.h>
```

```
void main( )
```

```
int A[10];
```

```
A=[3,2,5,4,7,9,10];
```

```
for( p = 0; p<=6; p++)
```

```
{
    if(A[p]%2=0)
```

```
int S = S+A[p];
}
```

```
cout<<S;
}
```

d. Find the output of the following C++ program: 2

```
#include<iostream.h>
```

```
void repch(char s[])
```

```

{
    for (int i=0;s[i]!='\0';i++)
    {
        if(((i%2)!=0) &&(s[i]!=s[i+1]))
        {
            s[i]='@';
        }
        else if (s[i]==s[i+1])
        {
            s[i+1]='!';
            i++;
        }
    }
}

```

```

void main()
{
    char str[]="SUCCESS";
    cout<<"Original String"<<str
    repch(str);
    cout<<"Changed String"<<str;
}

```

e. Find the output of the following :

3

```

#include<iostream.h>
void switchover(int A[ ],int N, int split)
{
    for(int K = 0; K<N; K++)
        if(K<split)
            A[K] += K;
        else
            A[K]*= K;
}

```

```

void display(int A[ ],int N)
{
    for(int K = 0; K<N; K++)
        (K%2== 0) ?cout<<A[K]<<"% " : cout<<A[K]<<endl;
}
void main( )
{
    int H[ ] = {30,40,50,20,10,5};
    switchover(H,6,3);
    display(H,6);
}

```

f. Observe the following C++ code and find out , which out of the given options i) to iv) are the expected correct output. Also assign the maximum and minimum value that can be assigned to the variable 'Go'. 2

```

void main()
{
    int X [4] = {100,75,10,125};
    int Go = random(2)+2;
    for (inti = Go; i< 4; i++)
        cout<<X[i]<<"$";
}

```

- i. 100\$\$75 ii. 75\$\$10\$\$125\$\$ iii. 75\$\$10\$\$ iv. 10\$\$125\$

Q2a. Differentiate between data abstraction and data hiding. 2

b. Answer the questions (i) and (ii) after going through the following class : 2

```

class Exam
{
    int Rollno;
    char Cname[25];
    float Marks ;
public :
    Exam( )      //Function 1
    {
        Rollno = 0 ;
        Cname="";
        Marks=0.0;
    }
}

```

```

    }

    Exam(int Rno, char candname)           //Function 2
    {
        Rollno = Rno ;
        strcpy(Cname,candname);

    }

    ~Exam( )                               //Function 3
    {
        cout << "Result will be intimated shortly" << endl ;
    }

    void Display( )                         //Function 4
    {
        cout << "Roll no :"<<Rollno;
        cout<<"Name :"<<Cname;
        cout <<" Marks:"<<Marks;
    }
};

```

(i) Which OOP concept does Function 1 and Function 2 implement. Explain?

(ii) What is Function 3 called? When will it be invoked?

c. Define a class **Candidate** in C++ with the following specification : 4

Private Members :

A data members Rno(Registration Number) type long

A data member Cname of type string

A data members Agg_marks (Aggregate Marks) of type float

A data members Grade of type char

A member function setGrade () to find the grade as per the aggregate marks obtained by the student. Equivalent aggregate marks range and the respective grade as shown below.

<u>Aggregate Marks</u>	<u>Grade</u>
>=80	A
Less than 80 and >=65	B

Less than 65 and ≥ 50	C
Less than 50	D

Public members:

A constructor to assign default values to data members:
 Rno=0,Cname="N.A",Agg_marks=0.0

A function Getdata () to allow users to enter values for Rno. Cname, Agg_marks and call function setGrade () to find the grade.

A function dispResult() to allow user to view the content of all the data members.

d. Give the following class definition answer the question that is follow: 4

```

class University
{
    char name [20];
    protected :
    char vc[20];
public :
    void estd();
    void inputdata();
    void outputdata();
}

class College : protected University
{
    int regno;
    protected
    char principal()
public :
    int no_of_students;
    void readdata();
    void dispdata ( );
};

class Department : public College
    char name[20];
  
```

```

        char HOD[20];

    public :

        void fetchdata(int);

        void displaydata( );    }

```

i). Name the base class and derived class of college. 1

ii) Name the data member(s) that can be accessed from function displaydata().

iii) What type of inheritance is depicted in the above class definition?

iv) What will be the size of an object (in bytes) of class Department?

Qs. 3a. An integer array A [30][40] is stored along the column in the memory. If the element A[20][25] is stored at 50000, find out the location of A[25][30]. 3

b. Write the definition of functions for the linked implemented queue containing passenger information as follows: 4

```

struct NODE

{
    int Ticketno;

    char PName[20];

    NODE * NEXT;    };

class Queueofbus

{
    NODE *Rear, *Front;

    public:

        Queueofbus()

        {
            Rear = NULL;

            Front = NULL;    };

    void Insert();

    void Delete();

    ~Queueofbus()

    {
        cout<<"Object destroyed";    }

};

```

c. Write a function to sort any array of n elements using insertion sort . Array should be passed as argument to the function. 3

d. Write a function NewMAT(int A[][],int r,int c) in C++, which accepts a 2d array of integer and its size as parameters divide all those array elements by 6 which are not in the range 60 to 600(both values inclusive) in the 2d Array . 2

e.Evaluate the following postfix expression using stack and show the contents after execution of each Operations:470,5,4,^,25,/,6,* 2

Q4a.Consider a file F containing objects E of class Emp. 1

i)Write statement to position the file pointer to the end of the file

ii)Write statement to return the number of bytes from the beginning of the file to the current position of the file pointer.

b. Write a function RevText() to read a text file “ Input.txt “ and Print only word starting with ‘I’ in reverse order . 2

Example: If value in text file is: INDIA IS MY COUNTRY

Output will be: AIDNI SI MY COUNTRY

c. Write a function in C++ to search and display details, whose destination is “Chandigarh”from binary file “Flight.Dat”. Assuming the binary file is containing the objects of the following class: 3

class FLIGHT

```
{    int Fno;           //    Flight Number
    char From[20];      //    Flight Starting Point
    char To[20];        //    Flight Destination

public:
    char * GetFrom ( ); {    return from;    }
    char * GetTo( );   {    return To;      }
    void input()        {    cin>>Fno>>; gets(From); get(To);    }
    void show( )        {    cout<<Fno<< “:”<<From << “:” <<To<<endl; }

};
```

Section : B (Python)

Q1. a. List one similarity and one difference between List and Dictionary datatype 2

b. Observe the following Python functions and write the name(s) of the module(s) to which they belong:

1

a. uniform() b. findall()

c. Rewrite the following Python program after removing all the syntactical errors (if any), underlining each correction.:

2

```
def checkval:
    x = raw_input("Enter a number")
    if x % 2 = 0 :
        print x,"is even"
    else if x<0 :
        print x,"should be positive"
    else ;
        print x,"is odd"
```

```
def checkval():
    x = raw_input("Enter a number")
    if x % 2 == 0 :
        print x,"is even"
    elif x<0 :
        print x,"should be positive"
    else :
        print x,"is odd"
```

d. Find the output of the following Python program:

3

```
def makenew(mystr):
    newstr = " "
    count = 0
    for i in mystr:
        if count%2 !=0:
            newstr = newstr+str(count)
        else:
            if islower(i):
                newstr = newstr+upper(i)
            else:
                newstr = newstr+i
```



```

        count +=1

        newstr = newstr+mystr[:1]

        print "The new string is :",newstr

makenew("sTUdeNT")

```

e. Find the output of the following program

2

```

def calcresult () :

    i = 9

    while i> 1 :

        if (i % 2 == 0):

            x = i%2

            i = i-1

        else :

            i = i-2

            x = i

    print x**2

```

f. Observe the following Python code and find out , which out of the given options i) to iv) are the expected correct output(s).Also assign the maximum and minimum value that can be assigned to the variable 'Go'.

2

```

import random
X =[100,75,10,125]
Go = random.randint(0,3)
for i in range(Go):
    print X[i],"$$",

```

- i. 100\$\$75\$\$10 ii. 75\$\$10\$\$125\$\$iii. 75\$\$10\$\$ iv.10\$\$125\$\$100

Q2 a. Discuss the strategies employed by python for memory allocation?

2

b. Answer the questions (i) and (ii) after going through the following class definition:

2

```

class Toy :
    tid =0;
    tcat = ""

    def __init__(self):// Function1

```

..... // Blank 2

i. Explain relevance of Function 1.

ii. a. Fill in the blank2 with a statement to create object of the class TOY.

b. Write statement to check whether tprice is an attribute of class TOY.

c. Define a class Train in PYTHON with following description:

4

Data Members

src of type string
Tnm of type string
dest of type string
charges of float

• A member function Getdata to assign the following values for Charges

<u>Dest</u>	<u>Charges</u>
Mumbai	1000
Chennai	2000
Kolkatta	2500

Public members

- A constructor to initialize the data members.
- A function InputData() to allow the user to enter the values
- A function displaydata() to display all and call getdata function

d. Observe the following class definition and answer the question that follow:

2

```
class ParentClass(objects):  
    def __init__(self)  
        self.x = 1  
        self.y = 10  
    def print(self):  
        print(self.x, self.y)  
class ChildClass(ParentClass):  
    def __init__(self):  
        super(ChildClass, self).init_() # Line 1  
        self.x = 2  
        self.y = 20  
c = ChildClass()  
c.print()
```

a. Explain the relevance of Line1.

b. What type of inheritance is being demonstrated in the above code?

e. Write a user defined function findname(name) where name is an argument in Python to delete phone number from a dictionary phonebook on the basis of the name ,where name is the key.

2

Qs. 3a.Explain try..except...else ... with the help of user defined function def divide(x, y)which raises an error when the denominator is zero while dividing x by y and displays the quotient otherwise. 3

b. Write a user defined function arrangements(X), that accepts a list X of integers and sets all the negative elements to the left and all positive elements to the right of the list.

Eg: if L =[1,-2,3,4,-5,7] , the output should be: [-2,-5,3,4,7] 3

c. Consider the following class definition :- 3

```
class book ():  
    bk = []  
    def __init__(self, bno):  
        self.bno = bno  
    def addbook (self):  
        .....  
    def removebook (self):  
        .....
```

The class book is implemented **using Queue**. Keeping the same in mind, complete the function definitions for adding a book addbook() and deleting a book removebook() .

d. Write a python function generatefibonacci(n) where n is the limit using a generator function Fibonacci (max) where max is the limit n that produces Fibonacci series.. 3

e. Evaluate the following postfix using stack & show the content of the stack after the execution of each: 20, 4, +, 3, -, 7, 1 2

Q4a. Consider the following code : 1

```
f = open ("mytry", "w+")  
f.write ("0123456789abcdef")  
f.seek (-3,2) //1  
printf.read(2) //2
```

Explain statement 1 and give output of 2

b. Write a user defined function in Python that displays the number of lines starting with 'H' in the file Para.txt.Eg: if the file contains: 2

Whose woods these are I think I know.
His house is in the village though;
He will not see me stopping here
To watch his woods fill up with snow.

Then the line count should be 2.

c. Consider a binary file Employee.dat containing details such as empno:ename:salary (separator ':'). Write a python function to display details of those employees who are earning between 20000 and 40000.(both values inclusive) 3

Section : C

Q 5. a. Differentiate between cardinality and degree of a table with the help of an example. 2

b) Consider the following tables FACULTY and COURSES. Write SQL commands for the statements (i) to (v) and give outputs for SQL queries (vi) to (vii) 6

FACULTY

F_ID	Fname	Lname	Hire_date	Salary
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Soni	18-5-2001	14000
105	Rashmi	Malhotra	11-9-2004	11000
106	Sulekha	Srivastava	5-6-2006	10000

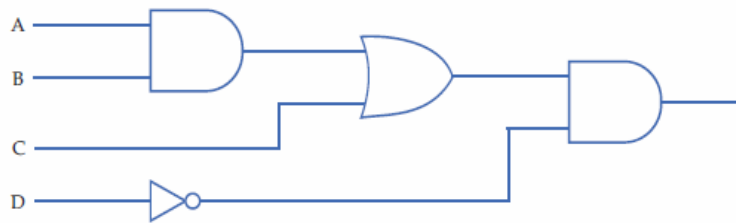
COURSES

C_ID	F_ID	Cname	Fees
C21	102	Grid Computing	40000
C22	106	System Design	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Network	20000
C26	105	Visual Basic	6000

- To display details of those Faculties whose salary is greater than 12000.
- To display the details of courses whose fees is in the range of 15000 to 50000 (both values included).
- To increase the fees of all courses by 500 of "System Design" Course.
- To display details of those courses which are taught by 'Sulekha' in descending order of courses.
- Select COUNT(DISTINCT F_ID) from COURSES;
- Select MIN(Salary) from FACULTY,COURSES where COURSES.F_ID = FACULTY.F_ID;

Q6.a. State and Verify Absorption law algebraically. 2

b. Draw a logic circuit for the following Boolean expression: $A.B+C.D'$. 2



c. Write the SOP form of a Boolean function F, which is represented in a truth table as follows:

1

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

d. Obtain a simplified form for a Boolean expression:

3

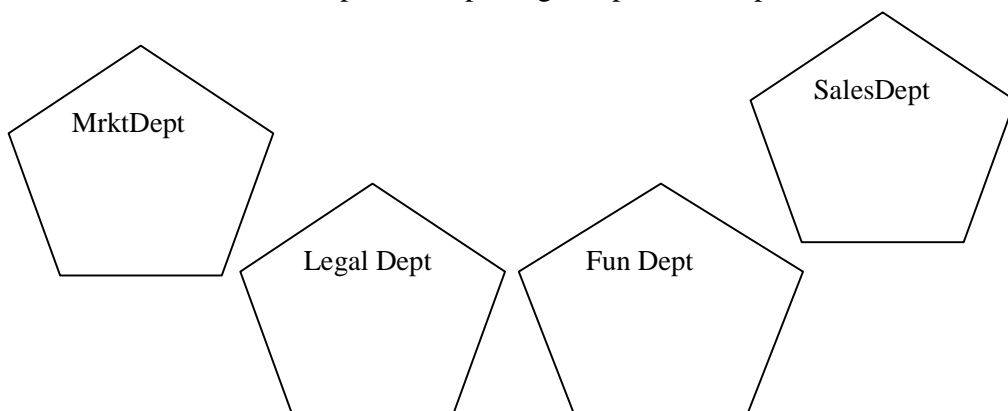
$$F(U, V, W, Z) = \Pi(0, 1, 3, 5, 6, 7, 15)$$

Q 7.a Write any 1 advantage and 1 disadvantage of Bus topology.

1

b. SunRise Pvt. Ltd. is setting up the network in the Ahmadabad. There are four departments named as MrktDept, FunDept, LegalDept, SalesDept.

4



Distance between various buildings is given as follows:

MrktDept to FunDept	80 m
MrktDept to LegalDept	180m
MrktDept to SalesDept	100 m
LegalDept to SalesDept	150 m
LegalDept to FunDept	100 m
FunDept to SalesDept	50 m

Number of Computers in the buildings:

MrktDept	20
LegalDept	10
FunDept	08
SalesDept	42

i) Suggest a cable layout of connections between the Departments and specify topology.

ii) Suggest the most suitable building to place the server with a suitable reason.

iii) Suggest the placement of i) modem ii) Hub /Switch in the network.

iv) The organization is planning to link its sale counter situated in various part of the same city/ which type of network out of LAN, WAN, MAN will be formed? Justify.

c. Name the protocol 1

i. Used to transfer voice using packet switched network.

ii.Used for chatting between 2 groups or between 2 individuals.

d. What is an IP Address? 1

e. What is HTTP? 1

f. Explain the importance of Cookies. 1

g. How is 4G different from 3G? 1