Marking Scheme- Computer Science (Code: 083)
Class XII (2016-17)

Time: 3 Hrs.			**MM: 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	
1	(a)	Explain conditional operator with suitable example?	2
	Ans	Conditional operator is also known as ternary operator because it requires three operands and can be used to replace simple if-else code. It is used to check the condition and execute first expression if condition is true else execute other. Syntax: **Conditional expression? Expression 1 : Expression 2;** Explanation: If the conditional expression is true then expression 1 executes otherwise expression 2 executes. Example: **int y=10,x;** **x=y>10?1:0;** **cout<<x;** Output: 0 (1 Mark for correct explanation) (1 Mark for correct example)	
	(b)	Which C++ header file(s) are essentially required to be included to run/execute the following C++ code : **void main()** **{**	1

www.careerindia.com

		char *word1="Hello",*word2="Friends"; **strcat(word1,word2);** **cout<<word1;** **}**	
	Ans	iostream.h string.h (½ Mark each for writing correct header file)	
	(c)	Rewrite the following program after removing the syntactical errors (if any). Underline each correction. **#include<conio.h>** **#include<iostream.h>** **#include<string.h>** **#include<stdio.h>** **class product** **{** **int product_code,qty,price;** **char name[20];** **public:** **product(){** **product_code=0;qty=0;price=0;** **name=NULL;** **}** **void entry()** **{** **cout<<"\n Enter code,qty,price";** **cin>>product_code>>qty>>price;** **gets(name);** **}** **void tot_price() {return qty*price;}** **};** **void main()** **{** **p product;** **p.entry();** **cout<<tot_price();** **}**	2
	Ans	**#include<conio.h>**	

www.careerindia.com

		**#include<iostream.h>
		#include<string.h>
		#include<stdio.h>
		class product
		{
		int product_code,qty,price;
		char name[20];
		public:
		product(){
		product_code=0;qty=0;price=0;
		strcpy(name,NULL);
		}
		void entry()
		{
		cout<<"\n Enter code,qty,price";
		cin>>product_code>>qty>>price;
		gets(name);
		}
		int tot_price() {return qty*price;}
		};
		void main()
		{
		product p;
		p.entry();
		cout<<p.tot_price();
		}**
		
		(½ Mark for each correction upto a maximum of four corrections)
		OR
		(1 Mark for only identifying any 4 errors without suggesting corrections)	

	(d)	Write the output of the following C++ program code:
		Note: Assume all required header files are already being included in the program.
		**void change(int *s)
		{
		for(int i=0;i<4;i++)
		{
		if(*s<40)**
			2

www.careerindia.com

		{ **if(*s%2==0)** ***s=*s+10;** **else** ***s=*s+11;** **}** **else** **{** **if(*s%2==0)** ***s=*s-10;** **else** ***s=*s-11;** **}** **cout<<*s<<" ";** **s++;** **}** **}** **void main()** **{** **int score[]={25,60,35,53};** **change(score);** **}**	
	Ans	36 50 46 42 **(½ Mark for each correct value of output)**	
	(e)	Write the output of the following C++ program code: Note: Assume all required header files are already being included in the program. **class seminar** **{** **char topic[30];** **int charges;** **public:** **seminar()** **{** **strcpy(topic,"Registration");** **charges=5000;** **}** **seminar(char t[])** **{**	3

www.careerindia.com

```
strcpy(topic,t);
charges=5000;
}
seminar(int c)
{
strcpy(topic,"Registration with Discount");
charges=5000-c;
}
void regis(char t[],int c)
{
strcpy(topic,t);
charges=charges+c;
}
void regis(int c=2000)
{
charges=charges+c;
}
void subject(char t[],int c)
{
strcpy(topic,t);
charges=charges+c;
}
void show()
{
cout<<topic<<"@"<<charges<<endl;
}
};
void main()
{
seminar s1,s2(1000),s3("Genetic Mutation"),s4;
s1.show();
s2.show();
s1.subject("ICT",2000);
s1.show();
s2.regis("Cyber Crime",2500);
s2.show();
s3.regis();
s3.show();
s4=s2;
s4.show();
```

www.careerindia.com

		getch(); **}**	
	Ans	**Registration@5000** **Registration with Discount@4000** **ICT@7000** **Cyber Crime@6500** **Genetic Mutation@7000** **Cyber Crime@6500** **(½ Mark for each correct line of output)** **Note:** **Deduct ½ Mark for not considering any "@" symbol.**	
	(f)	Observe the following program carefully and attempt the given questions: **#include<iostream.h>** **#include<conio.h>** **#include<stdlib.h>** **void main()** **{** **clrscr();** **randomize();** **char courses[][10]={"M.Tech","MCA","MBA","B.Tech"};** **int ch;** **for(int i=1;i<=3;i++)** **{** **ch=random(i)+1;** **cout<<courses[ch]<<"\t";** **}** **getch();** **}** I. Out of all the four courses stored in the variable courses, which course will never be displayed in the output and which course will always be displayed at first in the output? II. Mention the minimum and the maximum value assigned to the variable ch?	2
	Ans	I. M.Tech will never be displayed in the output. MCA will always be displayed at first in the output.	

www.careerindia.com

		II. Minimum value of ch=1 Maximum value of ch=3 **(½ Mark for each correct answer)** **Note:** **Deduct ½ Mark for writing any additional option.**	
2	(a)	What do you understand by Function overloading or Functional polymorphism? Explain with suitable example.	2
	Ans	It is a method of using the same function or method to work using different sets of input. Function overloading is one of the example of polymorphism, where more than one function carrying same name behave differently with different set of parameters passed to them. **void show()** **{** **cout<<"\n Hello World!";** **}** **void show(char na[])** **{** **cout<<"\n Hello World! Its "<<na;** **}** (1 Mark for correct explanation of Function overloading) (1 Mark for suitable example of Function overloading)	

	(b)	Answer the questions(i) and (ii) after going through the following class:
		class planet
		{
		char name[20];char distance[20];
		public:
		planet() //Function 1
		{
		strcpy(name, "Venus");
		strcpy(distance,"38 million km");
		}
		void display(char na[],char d[]) //Function 2
		{
		cout<<na<<"has "<<d<<" distance from Earth"<<endl;
			2

www.careerindia.com

```
}
planet(char na[], char d[])                    //Function 3
{
      strcpy(name,na);
      strcpy(distance,d);
}
~planet()                                      //Function 4
{
      cout<<"Planetarium time over!!!"<<endl;
}
};
```

I. What is Function 1 referred as? When will it be executed?

II. Write suitable C++ statement to invoke Function 2.

Ans

I. Constructor
It will be executed at the time of object creation.
(½ Mark for each correct answer)

II. planet p;
p.display("Pluto","7.5 Billion Km");
(½ Mark for each correct answer)

(c) Define a class DanceAcademy in C++ with following description: 4

Private Members

- Enrollno of type int
- Name of type string
- Style of type string
- Fee of type float
- A member function chkfee( ) to assign the value of fee variable according to the style entered by the user according to the criteria as given below:

Style	Fee
Classical	10000
Western	8000
Freestyle	11000

Public Members

www.careerindia.com

		• A function enrollment() to allow users to enter values for Enrollno,Name, Style and call function chkfee()to assign value of fee variable according to the Style entered by the user. • A function display() to allow users to view the details of all the data members.	
	Ans	**class DanceAcademy** **{** **int Enrollno;** **char Name[20];** **char Style[20];** **float Fee;** **void chkfee()** **{** **if(strcmpi(Style, "Classical")==0)** **Fee=10000;** **else if(strcmpi(Style, "Western")==0)** **Fee=8000;** **else if(strcmpi(Style, "Freestyle")==0)** **Fee=11000;** **}** **public:** **void enrollment()** **{** **cout<<"Please enter Enrollno,Name,Style";** **cin>>Enrollno;** **gets(Name);** **gets(Style);** **chkfee();** **}** **void display()** **{** **cout<<"\n Entered Enrollno, Name, Style and Fee is: "<<Enrollno<<"\t"<<Name<<"\t"<<Style<<"\t"<<Fee;** **}** **};** **(½ Mark for correct syntax of class header)** **(½ Mark for correct declarations of data members)**	

www.careerindia.com

		(1 Mark for correct definition of chkfee() function) **(1 Mark for correct definition of enrollment () function)** **(1 Mark for correct definition of display () function)** **Note:** **Deduct ½ Mark if chkfee() is not invoked properly inside enrollment() function.**	
	(d)	**Answer the questions (i) to (iv) based on the following:** **class indoor_sports** **{** **int i_id;** **char i_name[20];** **char i_coach[20];** **protected:** **int i_rank,i_fee;** **void get_ifee();** **public:** **indoor_sports();** **void iEntry();** **void ishow();** **};** **class outdoor_sports** **{** **int o_id;** **char o_name[20];** **char o_coach[20];** **protected:** **int orank,ofee;** **void get_ofee();** **public:** **outdoor_sports();** **void oEntry();** **void oshow();** **};** **class sports:public indoor_sports,protected outdoor_sports** **{** **char rules[20];** **public:** **sports();**	4

www.careerindia.com

		void registration(); **void showdata();** **};**	
		(i) Name the type of inheritance illustrated in the above C++ code.	
	Ans	Multiple Inheritance **(1 Mark for correct answer)**	
		(ii) Write the names of all the members, which are accessible from the objects belonging to class outdoor_sports.	
	Ans	Data Members: None Member Functions: oEntry(), oShow() **(1 Mark for correct answer)** **Note:** **No marks to be awarded for any partial or additional answer(s)**	
		(iii) Write the names of all the member functions, which are accessible from the member function of class sports.	
	Ans	registration(), showdata(), oEntry(), oShow(), get_ofee(), iEntry(), iShow(), get_ifee() **(1 Mark for correct answer)** **Note:** **No marks to be awarded for any partial or additional answer(s)**	
		(iv) What will be the size of the object belonging to class indoor_sports?	
	Ans	46 Bytes **(1 Mark for correct answer)**	
3	(a)	Write the definition of a function grace_score (int score [], int size) in C++, which should check all the elements of the array and give an increase of 5 to those scores which are less than 40. Example: if an array of seven integers is as follows: **45, 35, 85, 80, 33, 27, 90** After executing the function, the array content should be changed as follows: **45, 40, 85, 80, 38, 32, 90**	3

www.careerindia.com

	Ans	**void grace_score(int score[],int size)** **{** **for(int i=0;i<size;i++)** **{** **if(score[i]<40)** **score[i]=score[i]+5;** **cout<<score[i]<<" ";** **}** **}** **(½ Mark for correct function header)** **(1 Mark for correct loop)** **(½ Mark for correct checking of array elements for less than 40)** **(1 Mark each for Adding value 5 to the array elements which has value less than 40)**	
	(b)	An array P[30][20] is stored along the column in the memory with each element requiring 2 bytes of storage. If the base address of the array P is 26500, find out the location of P[20][10].	3
	Ans	Total number of rows= 30 Total size= 2 bytes Base Address= 26500 LOC (P[I][J]) = BaseAddress+((I-LBR) + (J-LBC) * R)*W Assuming Lower Bound of Row(LBR)=0 Lower Bound of Column(LBC)=0 Total number of Rows(R)=30 Size of each element(W)=2 LOC(P[20][10])= 26500 +((20-0)+(10-0)*30)*2 LOC(P[20][10])= 26500 +640 LOC(P[20][10])= 27140 **(1 Mark for using correct formula for column major)** **(1 Mark for substituting formula with correct values)** **(1 Mark for correct final answer)**	
	(c)	Write the definition of a member function push() for a class Library in C++ to insert a book information in a dynamically allocated stack	4

www.careerindia.com

		of books considering the following code is already written as a part of the program: **struct book** **{** **int bookid;** **char bookname[20];** **book *next;** **};** **class Library** **{** **book *top;** **public:** **Library()** **{** **top=NULL;** **}** **void push();** **void pop();** **void disp();** **~Library();** **};**	
	Ans	**void Library::push()** **{** **book *nptr;** **nptr=new book;** **cout<<"Enter values for bookid and bookname";** **cin>>nptr->bookid;** **gets(nptr->bookname);** **nptr->next=NULL;** **if(top==NULL)** **top=nptr;** **else** **{** **nptr->next=top;** **top=nptr;** **}** **}** **(1 Mark for creating new node)**	

www.careerindia.com

		(½ Mark for taking values from user) **(½ Mark for storing NULL in the variable responsible for linking in newly created node)** **(1 Mark for correct checking of top to be NULL or not and associate statement)** **(1 Mark for correct else part)**	
	(d)	Write a user-defined function swap_row(int ARR[ ][3],int R,int C) in C++ to swap the first row values with the last row values: For example if the content of the array is: 10 20 30 40 50 60 70 80 90 Then after function call, the content of the array should be: 70 80 90 40 50 60 10 20 30	2
	Ans	**void swap_row(int ARR[][3],int R,int C)** **{** **for(int i=0,j=0;j<C;j++)** **{** **int temp=ARR[i][j];** **ARR[i][j]=ARR[R-1][j];** **ARR[R-1][j]=temp;** **}** **}** **(1 Mark for correct loop)** **(1 Mark for correct swapping)**	
	(e)	Evaluate the following POSTFIX expression. Show the status of Stack after execution of each operation separately: **45, 45, +, 32, 20, 10, /, -,***	2

www.careerindia.com

	Ans	<table><tr><th>Element Scanned</th><th>Stack Status</th></tr><tr><td>45</td><td>45</td></tr><tr><td>45</td><td>45, 45</td></tr><tr><td>+</td><td>90</td></tr><tr><td>32</td><td>90, 32</td></tr><tr><td>20</td><td>90,32,20</td></tr><tr><td>10</td><td>90,32,20,10</td></tr><tr><td>/</td><td>90,32,2</td></tr><tr><td>-</td><td>90,30</td></tr><tr><td>*</td><td>2700</td></tr></table> Hence the final result is 2700 **(½ Mark for evaluating till + operator)** **(½ Mark for evaluating till / operator)** **(½ Mark for evaluating till - operator)** **(½ Mark for evaluating till * operator)** **Note:** **(1 Mark to be given for writing correct answer as 2700 without showing the Stack Status)**	
4	(a)	Find the output of the following C++ code considering that the binary file sp.dat already exists on the hard disk with 2 records in it. **class sports** **{** **int id;** **char sname[20];** **char coach[20];** **public:** **void entry();** **void show();** **void writing();** **void reading();** **};** **void sports::reading()** **{** **ifstream i;** **i.open("sp.dat");**	1

www.careerindia.com

		while(1) **{** **i.read((char*)&s,sizeof(s));** **if(i.eof())** **break;** **else** **cout<<"\n"<<i.tellg();** **}** **i.close();** **}** **void main()** **{** **s.reading();** **}**	
	Ans	42 84 **(½ Mark for each correct answer)**	
	(b)	Write a user defined function word_count() in C++ to count how many words are present in a text file named "opinion.txt". For example, if the file opinion.txt contains following text: Co-education system is necessary for a balanced society. With co-education system, Girls and Boys may develop a feeling of mutual respect towards each other. The function should display the following: Total number of words present in the text file are: 24	2
	Ans	**void word_count()** **{** **ifstream i;char ch[20];int c=0;** **i.open("opinion.txt ");** **while(!i.eof())** **{** **i>>ch;** **c=c+1;** **}**	

www.careerindia.com

		cout<<" Total number of words present in the text file are: "<<c; **}** **(½ Mark for opening opinion.txt correctly)** **(½ Mark for fetching each word from the file correctly)** **(½ Mark for counting each word)** **(½ Mark for correct display)**	
	(c)	Write a function display () in C++ to display all the students who have got a distinction(scored percentage more than or equal to 75) from a binary file "stud.dat", assuming the binary file is containing the objects of the following class: **class student** **{** **int rno;** **char sname [20];** **int percent;** **public:** **int retpercent()** **{** **return percent;** **}** **void getdetails()** **{** **cin>>rno;** **gets(sname);** **cin>>percent;** **}** **void showdetails()** **{** **cout<<rno;** **puts(sname);** **cout<<percent;** **}** **};**	3

www.careerindia.com

	Ans	**void display()** **{** **student s;** **ifstream i("stud.dat");** **while(i.read((char*)&s,sizeof(s)))** **{** **if(s.retpercent()>=75)** **s.showdetails();** **}** **i.close();** **}** **(½ Mark for opening stud.dat correctly)** **(1 Mark for reading all records from the file)** **(1 Mark for comparing desired value with obtained data)** **(½ Mark for calling showdetails() function)**	
Section - B (Python)			

1	(a)	Carefully observe the following python code and answer the questions that follow:
		`x=5`
		`def func2():`
		`  x=3`
		`  global x`
		`  x=x+1`
		`  print x`
		`  print x`
		
		On execution the above code produces the following output.
		6
		3
		Explain the output with respect to the scope of the variables.
			2

	Ans:	Names declared with global keyword have to be referred at the file level. This is because the global statement indicates that the particular variable lives in the global scope. If no global statement is being used, the variable with the local scope is accessed. Hence, in the above code the statement succeeding the statement global x informs python to increment the global variable x Hence the output is 6 i.e 5+1 which is also the value for global x.	

www.careerindia.com

		When x is reassigned with the value 3 the local x hides the global x and hence 3 is printed. (2 marks for explaining the output) (Only 1 mark for explaining global and local namespace.)	
	(b)	Name the modules to which the following functions belong: a. uniform() b. fabs()	1
	Ans:	a. random() b. math() (½ mark each for the correct modules)	

	(c)	Rewrite the following code after removing the syntactical errors (if any). Underline each correction.
		`def chksum:`
		`  x= input("Enter a number")`
		`  if (x%2 = 0):`
		`  for i range(2*x):`
		`  print i`
		`  loop else:`
		`  print "#"`
			2

	Ans:	**def chksum()**: x= input("Enter a number") **if (x%2 == 0):** **for i in range(2*x):** print i **else:** print "#" (½ mark for each correction) (1 mark to be given if only the errors are identified)	
	(d)	Observe the following Python code carefully and obtain the output, which will appear on the screen after execution of it.	2

www.careerindia.com

```
def Findoutput():
    L = "earn"
    X=""
    L1=[]
    count  = 1
    for i in L:
        if i in['a','e','i','o','u']:
            X=X+i.swapcase()
        else:
            if (count%2!=0):
                X= X+str(len(L[:count]))
            else:
                X = X+i
        count = count+1
    print X
Findoutput()
```

Ans:

EA3n

(½ mark for each correct character of the output)

(e) What output will be generated when the following Python code is executed? 3

```
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()
```

Ans:

[11, 10, 9, 8, 7, 4]

(½ mark for each correct value)

(Deduct ½ mark if output not displayed as a list i.e. missing [])

(f) Observe the following program and answer the questions that follow: 2

```
import random
X=3
N = random.randint(1,X)
for i in range(N):
    print i,'#',i+1
```

a. What is the minimum and maximum number of times the loop will execute?

www.careerindia.com

		b. Find out, which line of output(s) out of (i) to (iv) will not be expected from the program? I. 0#1 ii. 1#2 iii. 2#3 iv. 3#4	
	Ans:	a. Minimum Number = 1 Maximum Number = 3 b. Line iv is not expected to be a part of the output. (1 mark for correct Minimum and Maximum value) (1 mark for identifying iv as the answer)	
2	a	Explain the two strategies employed by Python for memory allocation.	2
	Ans:	Python uses two strategies for memory allocation- i. Reference counting ii. Automatic garbage collection. **Reference Counting:** works by counting the number of times an object is referenced by other objects in the system. When an object's reference count reaches zero, Python collects it automatically. **Automatic Garbage Collection:** Python schedules garbage collection based upon a threshold of object allocations and object de-allocations. When the number of allocations minus the number of deallocations are greater than the threshold number, the garbage collector is run and the unused block of memory is reclaimed. (1 mark for writing the names of both the strategies) (1 mark for explaining any one strategy) (2 mark for explaining both the strategies)	
	b	Observe the following class definition and answer the questions that follow:	2

www.careerindia.com

		``
		class Info:
		    ips=0
		    def __str__(self): #Function 1
		        return " Welcome to the Info Systems"
		    def __init__(self):
		        self.__Systemdate=""
		        self.SystemTime=""
		    def getinput(self):
		        self.__Systemdate = raw_input("enter data")
		        self.SystemTime=raw_input("enter data")
		        Info.incrips()
		    @staticmethod #Statement 1
		    def incrips():
		        Info.ips=Info.ips+1
		        print " System invoked",Info.ips,"times"
		I=Info()
		I.getinput()
		print I.SystemTime
		print I.__Systemdate # Statement 2
		``
		i. Write statement to invoke Function 1.
		ii. On Executing the above code , Statement 2 is giving an error explain.	

	Ans:	i. print I ii. The statement 2 is giving an error because __Systemdate is a private variable and hence cannot be printed outside the class. (1 mark for correct answer of i.) (½ mark for identifying __Systemdate as private variable and ½ mark for correct explanation)	
	c	Define a class PRODUCT in Python with the following specifications Data members: Pid – A string to store productid. Pname - A string to store the name of the product. Pcostprice – A decimal to store the cost price of the product Psellingprice – A decimal to store Selling Price Margin - A decimal to be calculated as Psellingprice - Pcostprice Remarks - To store”Profit” if Margin is positive else “Loss” if Margin is negative Member Functions:	4

www.careerindia.com

- A constructor function to initialize All the data members with valid default values.
- A method SetRemarks() that assigns Margin as Psellingprice - Pcostprice and sets Remarks as mentioned below:

Margin	**Remarks**
<0 (negative)	Loss
>0(positive)	Profit

- A method Getdetails() to accept values for Pid,Pname,Pcostprice,Psellingprice and invokes SetRemarks() method.
- A method Setdetails() that displays all the data members.

Ans:

```
class PRODUCT:
    def __init__(self):
        self.Pid = ""
        self.Pname = ""
        self.Pcostprice = 0.0
        self.Psellingprice = 0.0
        self.Margin      = 0.0
        self.Remarks    = ""
    def SetRemarks(self):
        self.Margin = self.Psellingprice - self.Pcostprice
        if (self.Margin <0):
            self.Remarks="Loss"
        else:
            self.Remarks="Profit"
    def Getdetails(self):
        self.Pid = raw_input("Enter Product Id")
        self.Pname = raw_input("Enter Product Name")
        self.Pcostprice = input("Enter Cost Price")
        self.Psellingprice =input("Enter Selling Price")
        self.SetRemarks()

    def Setdetails(self):
        print "Product Id" ,self.Pid
        print "Product Name", self.Pname
        print "Cost Price",self.Pcostprice
        print "Selling Price",self.Psellingprice
        print " Margin:",self.Margin
        print "Incurred:",self.Remarks
```

		(½ mark for correct syntax of class) (1 mark for correct __init__() method) (1 mark for correct definition of SetRemarks()) (1 mark for correct definition of Getdetails()) (½ mark for correct definition of Setdetails())	

	d	Answer the questions (i) to (iv) based on the following:
		`class Shop(object):`
		`  def __init__(self):`
		`  self.no_of_employees =0`
		`  self.no_of_brands=0`
		`  def getSdata(self):`
		`  self.no_of_employees=input("Number of employees")`
		`  self.no_of_brands=input("Number of brands")`
		`  def showSdata(self):`
		`  print self.no_of_employees`
		`  print self.no_of_brands`
		`class Brand (object):`
		`  def __init__(self):`
		`  self.name = ""`
		`  self.category=["Mens","Womens","Kids"]`
		`  self.avgprice=0.0`
		`  def getdata(self):`
		`  self.name = raw_input("Enter Brand Name")`
		`  self.avgprice = input("Enter Average Price")`
		`  def showdata(self):`
		`  print self.name`
		`  print self.category`
		`  print self.avgprice`
		
		`class Mall(Brand,Shop):`
		`  def __init__(self):`
		`  self.no_of_shops =0`
		`  def getdata(self):`
		`  super(Mall,self).getSdata()  # Statement1`
		`  super(Mall,self).getdata()  # Statement 2`
		`  self.no_of_shops = input("Enter number of shops")`
		`  def showdata(self):`
		`  print self.no_of_shops`
		`  print self.no_of_brands`
		`  _____  # Blank 1`
			4

		i. Which type of Inheritance is demonstrated in the above code?	

www

		ii. Explain Statement 1 and 2.	
		iii. Name the methods that are overridden along with their class name.	
		iv. Fill Blank1 with a statement to display variable category of class Brand.	
	Ans:	i. Multiple Inheritance (1 mark for the correct answer) ii. Statement 1 and 2 invoke the getSdata() function of class Shop and getData() function of class Brand respectively. (1 mark for the correct answer) iii. getdata() method of class Brand is overridden.When object of class Mall is created, M = Mall() M.getdata() getdata() method of class Mall is invoked and not of class Brand is called. (1 mark for the correct answer) iv. print Brand().category (1 mark for the correct answer)	
3	a	Consider the following unsorted list 95 79 19 43 52 3 Write the passes of bubble sort for sorting the list in ascending order till the 3rd iteration.	3
	Ans:	[79, 19, 43, 52, 3, 95] [19, 43, 52, 3, 79, 95] [19, 43, 3, 52, 79, 95] (1 mark for each correct iteration in sequence.)	
	b	Kritika was asked to accept a list of even numbers but she did not put	3

www.careerindia.com

		the relevant condition while accepting the list of numbers. You are required to write a user defined function oddtoeven(L) that accepts the List L as an argument and convert all the odd numbers into even by multiplying them by 2 .	

	Ans:	```
		def oddtoeven(L):
		    for i in range(len(L)):
		        if (L[i]%2!=0):
		            L[i] = L[i]*2
		``
		(1 mark for the correct loop)
		(1 mark for the correct condition)
		(1 mark for converting the number to even)	

	c	Aastha wants to create a program that accepts a string and *display the characters in the reverse order in the same line using a Stack*. She has created the following code , help her by completing the definitions on the basis of requirements given below :
		class mystack:
		def __init__(self):
		self.mystr= _____ # Accept a string
		self.mylist =_____ # Convert mystr to a list
		# Write code to display while removing element from the stack.
		def display(self):
		:
		:
			4

	Ans:	```
		class mystack:
		    def __init__(self):
		        self.mystr= raw_input("Enter the string")
		        self.mylist = list(self.mystr)
		
		    def display(self):
		        x= len(self.mylist)
		        if (x>0):
		                for i in range(x):
		                    print self.mylist.pop(),
		        else:
		                print "Stack is empty"
		``
		(½ mark for accepting the string)	

www.careerindia.com

		(1 mark for converting the string to list) (1 mark for checking whether the stack is empty) (½ mark for the correct loop) (1 mark for the correct use of pop() method)	
	d	Write a generator function generatesq() that displays the squareroots of numbers from 100 to n where n is passed as an argument .	2

	Ans:	`import math`
		`def generatesq(n):`
		`  for i in range(100,n):`
		`  yield(math.sqrt(i))`
		
		(½ mark for import math)
		(½ correct use of sqrt() function)
		(1 mark for yield())	

	e	Evaluate the following Postfix expression: 20,10,-,15,3,/,+,5,*	2

Symbol	Operation	Stack	Result
20	Push	20	
10	Push	20,10	
-	Pop(10) Pop(20) Push(20-10) =10	10	
15	Push	10,15	
3	Push	10,15,3	
/	Pop(3) Pop(15) Push(15/3)=5	10,5	
+	Pop(5) Pop(10) Push(10+5)=15	15	

www.careerindia.com

5	Push	15,5	
*	Pop(5) Pop(15) Push(15*5)=5	75	75

(½ mark for correct stack status till '-')
(½ mark for correct stack status till '/')
(½ mark for correct stack status till '+')
(½ mark for correct stack status till '*')

(½ mark for writing the correct result without working of Stack)

4	a	Observe the following code and answer the questions that follow:
		File = open("Mydata","a")
		_____ #Blank1
		File.close()
		i. What type (Text/Binary) of file is Mydata?
		ii. Fill the Blank 1 with statement to write "ABC" in the file "Mydata"
			1

	Ans:	i. Text File ***(½ mark for the correct answer)*** ii. File.write("ABC") ***(½ mark for the correct statement)***	
	b	A text file "Quotes.Txt" has the following data written in it: Living a life you can be proud of Doing your best Spending your time with people and activities that are important to you Standing up for things that are right even when it's hard Becoming the best version of you Write a user defined function to display the total number of words	2

www.careerindia.com

		present in the file.	

	Ans:	<pre>def countwords():
		  S= open("Mydata","r")
		  f = S.read()
		  z= f.split()
		  count = 0
		  for i in z:
		  count = count+1
		  print "Total number of words",count</pre> ***(½ mark for reading the file using read)***
		(½ mark for correctly using split())
		(½ mark for the correct loop)
		(½ mark for displaying the correct value of count)	

	c	Consider the following class declaration and answer the question that follows:
		<pre>import pickle
		class Student:
		  def __init__(self):
		  self.name=""
		  self.percent=0.0
		  def inputdata(self):
		  self.name=raw_input("Enter Name")
		  self.percent=input("Enter Percentage scored")
		  def returnpercent(self):
		  return (self.percent)
		  def displaydata(self):
		  print "Name:",self.name
		  print "Percent:",self.percent</pre> A nuj has been asked to display all the students who have scored less than 40 for Remedial Classes.
		Write a user defined function to display all those students who have scored less than 40 from the binary file "Student.dat" assuming it stores all the object of the class Student mentioned above.
			3

Ans:

```
def displaydata():
    X=open("student.dat","rb")
    S = Student()
    try:
        while (X):
            S=pickle.load(X)
            if (S.returnpercent()<40):
                S.displaydata()
    except EOFError:
        pass

    X.close()
```

(½ Mark for opening the file in "rb" mode)
(½ Mark for creating the object of the class student)
(½ Mark for the loop)
(½ Mark for loading the object from the file)
(½ Mark for calling returnpercent()to check percentage<40)
(½ Mark for displaying records)

Section – C

5 (a) Observe the table 'Club' given below: 2

Club

Member_id	Member_Name	Address	Age	Fee
M001	Sumit	New Delhi	20	2000
M002	Nisha	Gurgaon	19	3500
M003	Niharika	New Delhi	21	2100
M004	Sachin	Faridabad	18	3500

i. What is the cardinality and degree of the above given table?
ii. If a new column contact_no has been added and three more members have joined the club then how these changes will affect the degree and cardinality of the above given table.

Ans
i. Cadinality: 4
Degree: 5
(½ Mark for each correct answer)
ii. Cardinality: 7
Degree: 6
(½ Mark for each correct answer)

www.careerindia.com

(b) Write SQL commands for the queries (i) to (iv) and output for (v) to (viii) based on the tables 'Watches' and Sale given below. 6

Watches

Watchid	Watch_Name	Price	Type	Qty_Store
W001	HighTime	10000	Unisex	100
W002	LifeTime	15000	Ladies	150
W003	Wave	20000	Gents	200
W004	HighFashion	7000	Unisex	250
W005	GoldenTime	25000	Gents	100

Sale

Watchid	Qty_Sold	Quarter
W001	10	1
W003	5	1
W002	20	2
W003	10	2
W001	15	3
W002	20	3
W005	10	3
W003	15	4

i. To display all the details of those watches whose name ends with 'Time'

ii. To display watch's name and price of those watches which have price range in between 5000-15000.

iii. To display total quantity in store of Unisex type watches.

iv. To display watch name and their quantity sold in first quarter.

v. select max(price), min(qty_store) from watches;

vi. select quarter, sum(qty_sold) from sale group by quarter;

vii. select watch_name,price,type from watches w, sale s where w.watchid!=s.watchid;

viii. select watch_name, qty_store, sum(qty_sold), qty_store-sum(qty_sold) "Stock" from watches w, sale s where w.watchid=s.watchid group by s.watchid;

Ans **i. select * from watches where watch_name like '%Time'**

www.careerindia.com

(½ mark for SELECT query)
(½ mark for where clause)

ii. select watch_name, price from watches where price between 5000 and 15000;

(½ mark for SELECT query)
(½ mark for where clause)

iii. select sum(qty_store) from watches where type like 'Unisex';

(½ mark for SELECT query)
(½ mark for where clause)

iv. select watch_name,qty_sold from watches w,sale s where w.watchid=s.watchid and quarter=1;

(½ mark for SELECT query)
(½ mark for where clause)

v.

max(price)	min(qty_store)
25000	100

(½ mark for correct output)

vi.

quarter	sum(qty_sold)
1	15
2	30
3	45
4	15

(½ mark for correct output)

vii.

watch_name	price	type
HighFashion	7000	Unisex

(½ mark for correct output)

viii.

www.careerindia.com

watch_name	qty_store	qty_sold	Stock
HighTime	100	25	75
LifeTime	150	40	110
Wave	200	30	170
GoldenTime	100	10	90

(½ mark for correct output)

6 (a) Correct the following boolean statements: 2

1. X+1 = X
2. (A')'=A'
3. A+A'=0
4. (A+B)' = A.B

Ans:

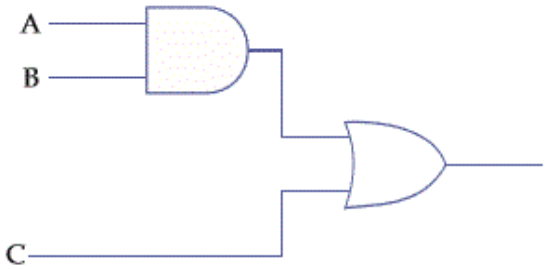
1. X+1 =1 or X+0=X
2. ((A')') = A
3. A + A'= 1 or A . A'=0
4. (A+B)' = A' . B'

(½ mark for each corrected statement)

(b) Draw the equivalent logic circuit for the following Boolean expression: 1

(A.B)+C

Ans:

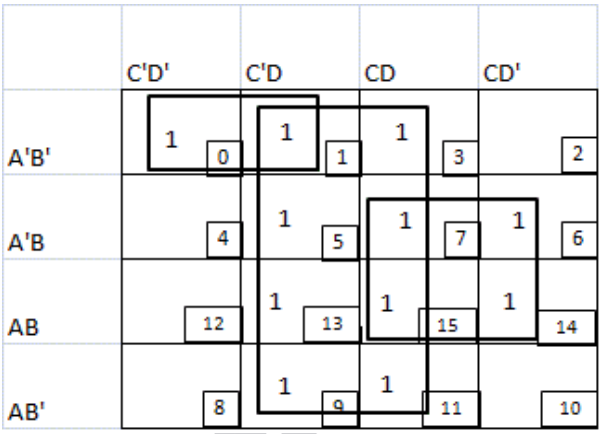


(½ mark for correct placement of each gate)

(c) Write the POS form of a Boolean Function F, which is represented in a truth table as follows: 2

P	Q	R	F
0	0	0	0
0	0	1	1

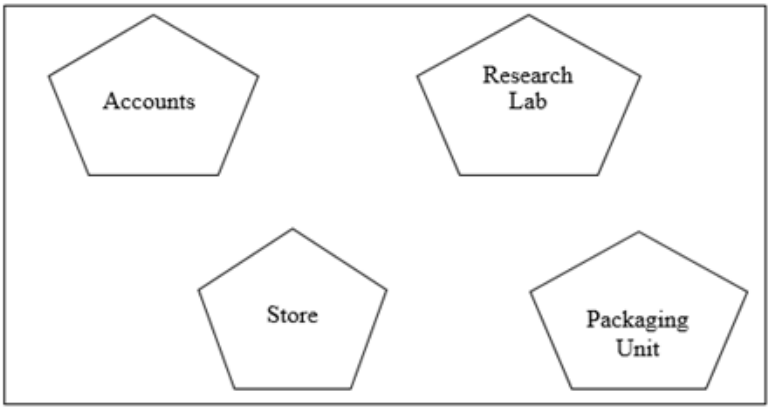
www.careerindia.com

		0 1 0 1 0 1 1 1 1 0 0 0 1 0 1 1 1 1 0 0 1 1 1 1	
	Ans:	(P+Q+R).(P'+Q+R).(P'+Q'+R) (½ mark each for correct maxterms) (½ mark for the correct representation as POS)	
	(d)	Reduce the following Boolean Expression using K Map: F(A,B,C,D)= $\Sigma(0,1,3,5,6,7,9,11,13,14,15)$	3
	Ans:	 A'B'C' + D + BC (½ mark for correct K MAP format) (½ mark for putting 1 at the right place) (½ mark for each correct groups) (½ mark for the correct answer)	
7	(a)	Identify the type of topology on the basis of the following: a. Since every node is directly connected to the server, a large amount of cable is needed which increases the installation cost of the network. b. It has a single common data path connecting all the nodes.	2

www.careerindia.com

	Ans:	a. Star Topology b. Bus Topology (1 mark for each correct answer)	
	(b)	Expand the following: a. VOIP b. SMTP	1
	Ans:	a. Voice Over Internet Protocol b. Simple Mail Transfer Protocol (½ mark for each correct answer)	
	(c)	Who is a hacker?	1
	Ans:	A computer enthusiast, who uses his computer programming skills to intentionally access a computer without authorization is known as hacker. A hacker accesses the computer without the intention of destroying data or maliciously harming the computer. (1 mark for the correct answer)	
	(d)	The following is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 (known as octets) separated by decimal points. 140.179.220.200 What is it? What is its importance?	1
	Ans:	It is an IP Address.It is used to identify the computers on a network. (½ mark for identification) (½ mark for the importance)	
	(e)	Daniel has to share the data among various computers of his two offices branches situated in the same city. Name the network (out of LAN, WAN, PAN and MAN) which is being formed in this process.	1
	Ans	MAN ***(1 mark for correct answer)***	
	(f)	Rehaana Medicos Center has set up its new center in Dubai. It has four buildings as shown in the diagram given below:	

www.careerindia.com



Distances between various buildings are as follows:

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	180 m

Number of Computers

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

1

As a network expert, provide the best possible answer for the following queries:

1

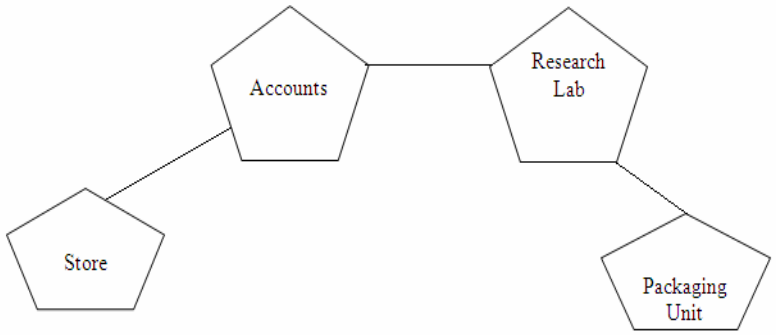
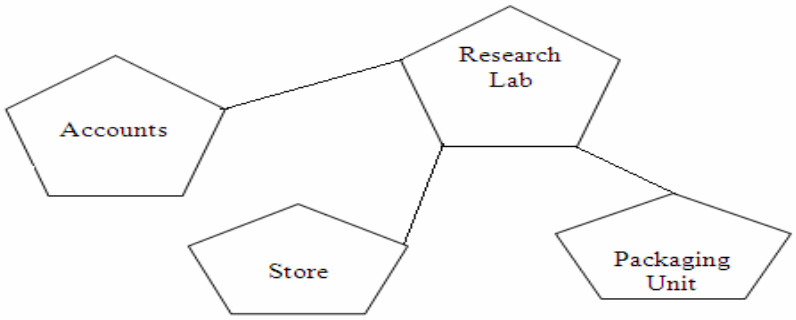
i) Suggest a cable layout of connections between the buildings.

1

ii) Suggest the most suitable place (i.e. buildings) to house the server of this organization.

1

www.careerindia.com

		iii) Suggest the placement of the following device with justification: a) Repeater b) Hub/Switch iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.	
	Ans	(i) Layout 1  Layout 2  (Any of the above) **(1 mark for drawing correct layout)** (ii)The most suitable place/ building to house the server of this organization would be building Research Lab, as this building contains the maximum number of computers. **(1 mark for correct answer)**	

www.careerindia.com

		(iii) a) For layout1, since the cabling distance between Accounts to Store is quite large, so a repeater would ideally be needed along their path to avoid loss of signals during the course of data flow in this route. For layout2, since the cabling distance between Store to Recresearch Lab is quite large, so a repeater would ideally be placed. b) In both the layouts, a Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building. **(½ mark for each correct answer)** (iv) Firewall **(1 mark for correct answer)**	

www.careerindia.com