

Series : BVM/1

SET – 4

Code No. 91

Roll No.				

Candidates must write the Code on the title page of the answer-book.

- Please check that this question paper contains 23 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 7 questions.
- Please write down the Serial Number of the question before attempting it.
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

COMPUTER SCIENCE

Time allowed : 3 hours

Maximum marks : 70

General Instructions :

- *(i)* **SECTION** *A* refers to programming language C++.
- (ii) **SECTION B** refers to programming language Python.
- (iii) **SECTION C** is compulsory for all.
- (iv) Answer either SECTION A or SECTION B.
- (v) It is compulsory to mention on the page 1 in the answering sheet whether attempting SECTION A or SECTION B.
- (vi) All questions are compulsory within each section.
- (vii) Questions 2(b), 2(d), 3 and 4 have internal choices.

SECTION – A

```
(Only for Candidates, who opted for C++)
```

- (a) Differentiate between call by value and call by reference in C++. Give an example to illustrate both.
 - (b) Write the names of the correct header files, which must be included to compile the following code successfully in a C++ compiler : 1

}

(c) Rewrite the following C++ program after removing any/all syntactical error(s) underline each correction done in the code : 2

Note: Assume all required header files are already included in the program.

2

```
typedef int[2][3] Matrix;
void main()
{
    Matrix M={23,45,45},{32,67,76};
    for (int C=0;C<2;I++)
        {
        for (R=0;R<3;R++)
            if (M[C][R]%5==0)
                cout<<M[C,R]<<"*";
            cout<<end1;
        }
}</pre>
```



```
Find and write the output of the following C++ program code:
(d)
    Note: Assume all required header files are already included in the program.
    void Changer(char Text [ ])
                                                                          2
     {
         for (int C=0;Text[C]!='\0';C++)
              if (Text[C]>='A'&& Text[C]<='M')</pre>
                   Text[C] +=2;
              else if (Text[C]>='U')
                   Text[C]='#';
              else
                   Text[C]++;
         }
         void main()
         {
              char Str[]="MODULE";
              Changer (Str) ;
              cout<<Str<<endl ;</pre>
         }
    Find and write the output of the following C++ program code :
                                                                          3
(e)
    Note: Assume all required header files are already included in the program.
    void Compute (int &P, int Q=10)
     {
         P=P*Q;
         Q=P/Q;
         cout<<P<<"#"<<Q<<endl;
     }
    void main()
     {
         int K=15, L=5;
         Compute(K,L);
         Compute(L);
         Compute(K);
     }
                                                                      P.T.O.
                                  3
```

(f) Observe the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the minimum and maximum values that can possibly be assigned to the variable Begin.
 2 Note :

- Assume all the required header files are already being included in the code.
- The function random(N) generates any possible integer between 0 and N-1 (both values included)

```
void main()
{
    randomize();
    char Txt[]="ABCDEFGH";
    int Begin = random(2) + 2;
    int Last = random(3) + Begin;
    for(int C=Begin; C<=Last; C++)</pre>
    cout<<Txt[C]<<"#";
}
(i)
      C#D#E#
                    (ii)
                          E#F#G#
(iii) B#C#D#E#
                    (iv)
                          F#G#H#
```

(a) Given the following class Furniture and assuming all necessary header file(s) included, answer the questions that follow the code :
 class Furniture

```
class Furnit
{
```

```
int Code; char Type[20];
    public :
                                          // Function 1
        Furniture(int C)
    {
        Code = C;
    }
    Furniture(char T[])
                                          //Function 2
    {
        strcpy(Type,T);
    }
    Furniture(char T[], int C)
                                          //Function 3
    {
        Code = C;
        strcpy(Type,T);
    }
                                          //Function 4
    Furniture (Furniture &F)
    {
        Code = F.Code + 10;
        strcpy (Type ,F.Type);
    }
};
```

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2.



```
void main ()
     {
         Furniture F1(5);
                                                      //Statement I
                                                      //Statement II
         Furniture F2(10);
         Furniture F3(20, "TABLE");
                                                      //Statement III
                                                      //Statement IV
                                    _;
     }
    (i)
         Which of the statement(s) out of (I), (II), (III), (IV) is/are incorrect for
         object(s) of the class Furniture.
                                                                          1
         What is Function 4 known as ? Write the Statement IV, that would
    (ii)
         execute Function 4.
                                                                          1
    Observe the following C++ code and answer the questions (i) and (ii) :
(b)
    Note : Assume all necessary files are included.
    class Packing
     {
         int L,B;
    public:
         Packing(int TL=10, int TB=20) //Function 1
          {
              L = TB;
              B = TL;
         }
                                                  //Function 2
         ~Packing()
          {
              cout<<"Package Moved "<<endl;</pre>
         }
                                                 //Function 3
              void Display()
          {
              cout<<L<<" & "<<B<<" Units"<<endl;</pre>
         }
     };
    void main ()
     {
         Packing P(25);
         P.Display() ;
     }
    (i)
         For the class Packing, what is Function 2 known as ? When is it executed ? 1
         What is the output of the above code, on execution?
    (ii)
                                                                           1
                                 OR
```

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Explain Function Overloading in context of Object Oriented Programming. Also give a supporting example in C++.

- (c) Write the definition of a class ENVIRONMENT in C++ with following description : Private Members
 - City // character of size 20
 - PMLevel // integer
 - Health // character of size 15
 - AssignHealth() /* Member function to assign value of Health based upon PMLevel*/

PMLevel	Health
Less than or equal to 50	Healthy
More than 50 and less than	Moderate
or equal to 100	
More than 100	Unhealthy

Public Members

```
    In() /* Function to allow user to enter
values of city, PMLevel and
then invoke AssignHealth() to
assign value of Health */
```

- Out() // Function to display all the data members
- (d) Answer the questions (i) to (iv) based on the following : Class Complex

```
4
```

```
Class Complex
{
    int Code;
protected:
    double Area;char Location[20] ;
public:
    void Get();void Put();
};
class Block: private Complex
{
    char BCode;
public:
    void BGet(); void BPut();
};
class Flat : public Block
{
    int FNo,NOR;
public:
    void FGet(); void FPut();
};
void main()
{
    Flat F;
}
                         6
```

Which type of Inheritance out of the following is illustrated in the above (i) example?

Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance

- (ii) Write the names of all the members, which are directly accessible by the member function **BPut()** of class **Block**.
- (iii) Write the names of all the data members, which are directly accessible by the member functions of class Flat.
- (iv) Write the names of all the members, which are directly accessible by the object F of class Flat declared in the main() function.

OR

Consider the following class company :

```
class Company
    int Code;
    char Name[20];
protected :
    float Turnover;
public:
    void In() {cin>>Code; gets(Name) ; cin>>Turnover;}
    void Out() {cout<<Code<<Name<<Turnover<<endl;}</pre>
```

};

{

Write a code in C++ to privately derive another class Branch from base class Company with following members :

Data Members

BCode of type long

BAddress of type character of size 10

Member Functions

- A constructor function to assign BCode as 1000. •
- Input() to allow user to enter BCode and BAddress. •
- Output() to display BCode and BAddress. •
- 3. Write a user-defined function AddSevenNine (int P[], int N) in C++, (a) which should find sum of those values in array P, which are ending with 7 or 9. Example: if the array Arr contains 3

27 18 22 39 9

Then the function should display the output for sum of (27, 39 and 9) as : Sum=75

OR

Write a user-defined function AlterSwap(int R[], int N) in C++, which should swap contents of the adjacent elements. N (which is an even integer) represents the total number of elements in the array R.

Example : If the array **R** contains the following elements (for N = 6)

0	1	2	3	4	5
20	50	70	30	80	90

Then the function should rearrange the array to become

0	1	2	3	4	5
50	20	30	70	90	80

NOTE :

• **DO NOT DISPLAY** the Changed Array contents

• Do not use any .other array to transfer the contents of array R.

(b) Write a user-defined function MakeChange(char T[4][4]) in C++, which replaces every occurrence of alphabet `A' with an alphabet `X' in the array.

For example :

ORIGINAL ARRAY T				
L	A	Z	Y	
A	U	R	A	
F	L	A	W	
Н	A	Z	Y	

CHANGED ARRAY T				
L	х	Z	Y	
х	U	R	Х	
F	L	Х	W	
H	х	Z	Y	

NOTE :

• **DO NOT DISPLAY** the Changed Array contents

• Do not use any other array to transfer the contents of array T.

OR

Write a user-defined function **sumleft** (int A[4][4]) in C++, which find the sum of left diagonal elements :

For example :

0	RIGINAL	ARRAY	A
10	12	20	22
30	32	40	42
50	52	60	62
70	72	80	82

8

Output :

• Sum of left diagonal : 184



(c)

Let us assume T[10][15] is a two dimensional array, which is stored in the memory along the row with each of its element occupying 4 bytes, find the address of the element T[5][7], if the address of the element T[7][10] is 35000. Also, find the total number of elements which can be stored in the Array T. 3

OR

Let us assume P[16] [23] is a two dimensional array, which is stored in the memory along the column with each of its element occupying 4 bytes, find the address of the element P[5][8], if the base address of the array is 35000.

(d) Write a user-defined function Pop (Box B[], int &T), which pops the details of a Box, from the static stack of Box B, at the location T (representing the Top end of the stack), where every Box of the stack is represented by the following structure. 4

struct Box

```
{
```

```
Length,Width,Height;
int
```

};

OR

For the following structure of Box in C++ struct Box

{

```
Int Length,Width,Height;
Box *Link;
```

};

Given that the following declaration of class BoxStack in C++ represents a dynamic stack of Box:

class BoxStack

```
{
```

Box *Top; //Pointer with address of the Topmost Box of stack

public:

BoxStack() ł

Top = NULL; } void Push(); //Function to into the push Box а dynamic stack void Pop(); //Function to from the pop а Box

dynamic stack ~BoxStack();

};

Write the definition for the member function void BoxStack: :Push(), that pushes the details of a Box into the dynamic stack of BoxStack.



(e) Evaluate the following Postfix expression, showing the stack contents.

100,2,/,5,2,3,+,*,-

OR

Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion.

 $\mathbf{U} - \mathbf{V}/\mathbf{W} + \mathbf{X} + \mathbf{Y}$

4.

(a) A text file named WORDS.TXT contains some text. Write a user-defined function
 MAGICWORDS () in C++ to read and display those words, which is starting with alphabet 'A' (irrespective of upper or lower case).

```
For example : if the file WORDS.TXT contains :
```

A lot of adorable cute dolls were displayed in Showbiz festival.

Anya had boxes of Pizzaz in her hand

The function should display:

Α

adorable

Anya

OR

A text file named **DRAFT.TXT** contains some text. Write a user-defined function MakeNew() in C++, which transfers lines from **DRAFT.TXT** to **FINAL.TXT**, which are not starting with alphabet 'X'.

For example: if the file **DRAFT.TXT** contains:

Completed 3 chapters of Chemistry

XCompleted all chapters of English

Completed 4 chapters of Physics

Completed 5 chapters of English

Then the function MakeNew() should transfer the following lines to FINAL.TXT:

10

Completed 3 chapters of Chemistry

Completed 4 chapters of Physics

Completed 5 chapters of English



(b) Write a user-defined function TotalPrice() in C++ to read each object of a binary file STUDENT.DAT, and count the number of students, who are paying Fee more than 1500. Assume that the file STUDENT.DAT is created with the help of objects of class STUDENT, which is defined below :

```
class STUDENT
{
    int Rno;char Name[20]; float Fee;
public:
    float Rfee() { return Fee; }
    void Show()
    {cout<<Rno<<"|"<<Name<<"|"<<Fee<<endl; }
};</pre>
```

OR

A binary file HARDWARE.DAT contains records stored as objects of the following class :

```
class HARDWARE
```

{

```
int ID; char Device[20]; float Price;
public:
    int *GetID() {return ID;}
```

```
float *GetPrice() {return Price;}
void Display()
{cout<<ID<<" # "<<Device<<" # "<<Price<<endl;</pre>
```

};

Write a user-defined function **Economic()** in C++, which displays the details of those HARDWARE devices from the file HARDWARE.DAT, which are priced less than 2000.

(c) Find the output of the following C++ code considering that the binary file HARDWARE.DAT exists on the hard disk with the following 5 records for the class HARDWARE as declared in the previous question (4 b).

ID	Device	Price
101	Optical Mouse	300
103	Laser Mouse	1100
102	Wireless Keyboard	2200
104	Headphone	1700
105	Wired Keyboard	1000

```
void main ()
{
   fstream File;
   File.open("HARDWARE.DAT",ios::binary|ios::in);
   HARDWARE H;
```

```
File.seekg((2*sizeof(H)));
File.read((char*)&H, sizeof(H));
File.read((char*)&H, sizeof(H));
cout<<H.GetPrice()<<endl;
cout<<"Record: "<<File.tellg()/sizeof(H) <<endl;</pre>
```

File.close() ;

}

OR

Differentiate between tellp() and seekp().

SECTION B

[Only for candidates, who opted for Python]

(a)	Whic	ch of the following are valid oper	rators in Python :
	(i)	**	(ii) */
	(iii)	like	(iv)
	(v)	is	(vi) ^
	(vii)	between	(viii) in

- (b) Name the Python Library modules which need to be imported to invoke the following functions : 1
 - (i) search()
 - (ii) date()
- (c) Rewrite the following code in python after removing all syntax error(s). Underline each correction done in the code.
 2

25=Val

```
for I in the range(0,Val)
if I%2==0:
    print I+1
Else:
    print I-1
```

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1.



```
2
(d)
    Find and write the output of the following python code :
    Text1="AISSCE 2018"
    Text2=" "
    I=0
    while I<len(Textl) :
         if Text1[I]>="0" and Text1[I]<="9":</pre>
             Val = int(Text1[I])
             Val = Val + 1
             Text2=Text2 + str(Val)
         elif Text1[I]>="A" and Text1[I] <="Z":</pre>
             Text2=Text2 + (Text1[I+1])
         else :
             Text2=Text2 + "*"
         I=I+1
    print Text2
(e)
   Find and write the output of the following python code :
                                                                     3
          Convert(X=45,Y=30) :
    def
         X=X+Y
         Y=X-Y
         print X,"&",Y
         return X
    A=250
    B=150
    A=Convert(A,B)
    print A,"&",B
    B=Convert(B)
    print A,"&",B
    A=Convert(A)
    print A, "&", B
    What possible output(s) are expected to be displayed on screen at the time of
(f)
    execution of the program from the following code ? Also specify the minimum
    values that can be assigned to each of the variables From and To
                                                                     2
    import random
    VAL=[15,25,35,45,55,65,75,85]
    From=random.randint(1,3)
    To=random.randint(Start,4)
    For I in range (From, To+1):
        print VAL(I), "*",
 (i) 35 * 45 * 55 * 65 * 75 *
                                     (ii) 35 * 45 * 55 *
 (iii) 15 * 25 * 35 * 45 *
                                     (iv) 35 * 45 * 55 * 65 *
```

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2. (a) What is Overriding Methods in context of Object Oriented Programming ? Illustrate with a suitable example. 2

```
(b) class Travel:
```

```
Fare = 1000
Type="AIR"
def _init_(self,T,F=3000):
    self.Type = T
    self.Fare = F
    def Disp(self) :
        print self.Type,Travel.Type
        print self.Fare,Travel.Fare
T1=Travel("BUS",500)
T1.Disp()
Travel.Type="TRAIN"
T2=Travel("AIR")
```

T2.Disp() Write the output of the above Python code.

```
OR
```

class Area:	#Line	1
<pre>def _init_(self):</pre>	#Line	2
self.Length = 20	#Line	3
self.Breadth = 10	#Line	4
def Display(self):	#Line	5
print self.Length,self.Breadth	#Line	6
<pre>def _del_(self) :</pre>	#Line	7
print "Area Over"	#Line	8
def Work():	#Line	9
A=Area()	#Line	10
A.Display()	#Line	11
Work()	#Line	12

- (i) What are method / functions mentioned in Line 2 and Line 7 specifically known as ?
- (ii) Mention the line number of the statement, which will call and execute the method / function shown in Line 2.



2

- (c) Define a class ENVIRONMENT in Python with following specifications : Instance Attributes
 - City // String
 - PMLevel // integer
 - Health // String

Methods/Functions

• AssignHealth() # To assign value of

Health based upon PMLevel

PMLevel	Health
Less than or equal to 50	Healthy
More than 50 and less than or equal to 100	Moderate
More than 100	Unhealthy

٠	In()	#	To allow user to enter values
		#	of City, PMLevel and then invoke
		#	AssignHealth() to assign value
		#	of Health

• Out() # To display all the Attributes

(d) Answer the questions (i) to (iii) based on the following :

class Headl(object):	#Line 1	L
<pre>def _init_(self,tp):</pre>	#Line 2	2
self.P = tp		
<pre>def Change(self,tp):</pre>	#Line 3	3
self.P = tp + self.P		
<pre>def Printl(self):</pre>	#Line 4	1
print self.P		
class Head2(object):	#Line 5	5
<pre>def _init_(self,tq):</pre>	#Line 6	5
self.Q=tq		
<pre>def Change(self,tq):</pre>	#Line 7	7
<pre>self.Q =2*tq + self.Q</pre>		
<pre>def Print2(self):</pre>	#Line 8	3
print self.Q		
class Tail(Head1,Head2):	#Line 9	€
15		Ē

	def	_init_(self,tr) :	#Line 10	
		self.R=tr		
		Count=0		
		if self.R==0		
		Count=10		
		else:		
		Count=20		
		<pre>Headlinit_(self,Count)</pre>	#Line 11	
		<pre>Head2init_(self,Count)</pre>	#Line 12	
	def	ChangeAll(self,c):	#Line 13	
		Headl.Change(self,c)		
		Head2.Change(self,c)		
	def	PrintAll(self):	#Line 14	
		print self.R,		
		Headl.Printl(self)		
		Head2.Print2(self)		
	T=Tail(0)	#Line 15	
	T.Chang	eAll(7)		
	T.Print	All()		
(i)	Write the t	ype of the inheritance illustrated in the	above.	1
(ii) Find and w	rite the output of the above code.		2
(ii	i) What is the	difference between the statements show	vn in Line 11 and Line 12?	1
		OR		
D: di	ifferentiate bet fference betwe	ween Multiple and Multilevel inherita en the two using suitable Python code	ance in Python. Illustrate the s for each.	
C	onsider the foll	owing randomly ordered numbers stor	ed in a list	3
60	0, 40, 70,	20, 50, 10		
Sł m	now the conter ethod used for	nt of list after the First, Second and T arranging in descending order .	hird pass of the bubble sort	
Ne ch	ote: Show the stanges.	status of all the elements after each pa	ss very clearly encircling the	
	C	OR		
C	onsider the foll	owing randomly ordered numbers stor	ed in a list	

70, 30, 60, 20, 15, 10

Show the content of the list after the First, Second and Third pass of the selection sort method used for arranging in **ascending order**.

Note: Show the status of all the elements after each pass very clearly encircling the changes.



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3.

(a)

(b) Write definition of a method/function TenTimesEven(VALUES) to add and display the sum of ten times of the even values present in the list of VALUES.
 3 For example,

If the Nums contain [5,2,3,6,3,4]

The method/function should display

Twice of Odd Sum: 120

(i.e. $2 \times 10 + 6 \times 10 + 4 \times 10$)

OR

Write definition of a method/function EndingA(Names) to search and display those strings from the list of Names, which are ending with 'A'.

For example,

```
If the Names contain ["JAYA", "KAREEM", "TARUNA", "LOVISH"]
```

The method/function should display

JAYA

TARUNA

(c) Write InsertQ(Customer) and DeleteQ(Customer) methods/functions in Python to add a new Customer and delete a Customer from a list of Customer names, considering them to act as insert and delete operations of the Queue data structure.

OR

Write **MakePush(Package)** and **MakePop(Package)** methods/functions in Python 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.

(d) Write a python method/function Scroller(Lineup) to scroll all the elements of a list Lineup by one element ahead and moving the last element to the first. Also, display the changed content of the list.

For Example:

If the list has following values in it

[25,30,90,110,16]

After changing the list content should be displayed as

[16,25,30,90,110]

OR

Write a python method/function **REVERSAR(Number)** to find a new number **Reverse** from **Number** with each of the digits of Number in reversed order and display the content of **Reverse** on screen.

For Example:

If the value of Number is 3451

The method/function should be displayed as

1543

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(e) Evaluate the following Postfix expression, showing the stack contents.

46,2,/,5,3,*,-,20,+

OR

Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion.

J + K / L - M * N

4. (a) Write a statement in Python to open a text file MARKER.TXT so that existing content can be read from it. 1

OR

Write a statement in Python to open a text file DATA.TXT so that new contents can be written in it.

(b) Write a method/function ABLINES() in python to read contents from a text file LINES.TXT, to display those lines, which is either starting with an alphabet 'A'.
 2 For example:

If the content of the file is

```
A BOY IS PLAYING OUTSIDE
THE PLAYGROUND IS BIG
```

BANYAN TREE IS IN THE GROUND

The method/function should display

```
A BOY IS PLAYING OUTSIDE
```

OR

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Write a method/function SHORTWORDS() in python to read lines from a text file WORDBANK.TXT, and display those words, which are lesser than 5 characters.

For example :

If the content of the file is

HAPPY JOY WELCOME KITE

LOVELY POSITIVE FUN

The method /function should display

JOY

KITE

FUN

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(c) Considering the following definition of class MEDICINES, write a method/function MildMedicine() in python to search and display Mname and Type from a pickled file MEDI.DAT, for the MEDICINES, whose type is "MILD".
 3 class MEDICINES :

```
def _init_ (self,MN,T) :
    self.Mname=MN
    self.Type=T
def MDisplay(self) :
    print self.Mname,">>",self.Type
```

OR

Considering the following definition of class STUDENT, write a method/function MERIT() in python to search and display all the content from a pickled file STUDENT.DAT, where Marks of STUDENT is more than 75.

class STUDENT:

```
def _init_(self ,N,M) :
    self.Name=N
    self.Marks=M
def Display(self):
    print self .Name, ">>", self .Marks
```

SECTION C

[For all candidates]

5. (a) Observe the following tables carefully and answer the questions that follow : 2

TABLE : FARMER		
FNO	NAME	
101	Ramya Sarkar	
102	Ram Dhyan	
103	Gagan Hari	
104	Ram Dhyan	

Which attribute out of the two attributes FNO and NAME in table FARMER should be considered as Primary Key? Give reason for your selection of the same.

P.T.O.

(b) Write SQL queries for (i) to (iv) and write outputs for SQL queries (v) to (viii), which are based on the following tables :

FCODE	FNAME	Gender	Room	Subject	JoinDate
F1001	Hari Charan Jha	Male	101	English	2000-10-11
F1004	Merry Jose	Female	202	Programming	2003-11-30
F1002	Fardeen Khan	Male	301	Web Design	2001-09-06
F1005	Priya Maheshwari	Female	302	Web Design	2004-12-15
F1009	Tanya Santan	Female	203	Programming	2006-12-31
F1006	Amar Anshul	Male	208	Data Structure	2005-05-02

Table: FACULTY

 Table : SCHEDULE

CCODE	PCODE1	FCODE2	FCODE3	FCODE4
Cl	F1009	F1002	F1001	F1005
C2	F1001	F1009	F1005	F1006
С3	F1006	F1001	F1004	F1002
C4	F1002	F1006	F1009	F1001

NOTE: All Dates are given in 'YYYY-MM-DD' format

- (i) To display details of all Male faculties from the FACULTY table.
- (ii) To display the FCODE, FNAME and GENDER of all faculties, who are either teaching subject "Programming" or teaching subject "Web Design".
- (iii) To display FCODE, FNAME, JOINDATE, ROOM of all faculty members in descending order of the ROOM numbers.
- (iv) To add a new faculty member with the following details :

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Note: While writing the answers of the following output questions, consider the original data as given in the above tables (i.e., without considering the changes done by part iv of this question)

- (v) SELECT COUNT(FCODE1), COUNT(FCODE2) FROM SCHEDULE WHERE FCODE1='F1009' OR FCODE2='F1009';
- (vi) SELECT CCODE, FCODE3, FNAME FROM FACULTY, SCHEDULE WHERE FACULTY.FCODE=SCHEDULE.FCODE3 AND FACULTY.FCODE='F1001';
- (vii) Select gender, count (*) from faculty group by gender;
- (viii) SELECT MIN (ROOM) FROM FACULTY WHERE JOINDATE>'
 2004-12-15';



- 6. (a) Verify the following using truth table. 2 (i) X.(X+Y)=X(ii) X+X'.Y=X+Y(b) Draw the Logic Circuit of the following Boolean Expression : 2 U' + V.W' + R
 - (c) Derive a Canonical POS expression for a Boolean function F, represented by the following truth table :

P	Q	R	F(P,Q,R)
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

- (d) Reduce the following Boolean Expression to its simplest form using K-Map : 3 $F(A,B,C,D) = \Sigma(2,5,6,7,8,9,10,11,14,15)$
- (a) Priyam Chattopadhyay found one file XYX.EXE in his computer and he has been informed by his computer expert friend that he should not execute the file and not to send to anyone as it is infected and unless he runs or opens, it won't cause any harm. Which of the following type category of infection it will be considered ? Also, mention, what he should do to prevent this infection ?
 - (i) Virus

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- (ii) Worm
- (iii) Trojan Horse
- (b) Ravi Jayaraman wants a client/server protocol, in which e-mail is received and held by him on his computer from Internet server. Regularly, it should check his mailbox on the email server and download mails to his computer. Which protocol out of the following will be ideal for the same ?

(i) POP3 (ii) SMTP

(iii) VolP (iv) HTTP

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- (c) Give two differences between 2G and 3G telecommunication technologies.
- (d) Write the expanded names for the following abbreviated terms used in Networking and Communications : 2
 - (i) PPP
 - (ii) HTTP
 - (iii) GSM
 - (iv) FTP
- (e) Evolving World Centre is a charitable trust responsible for providing yoga and meditation training to young and old persons for helping the society to have good health and also spreading peace in the society. The centre is planning to make full use of technology tools and modern gadgets in the centre for 100% utilisation of the resources. The centre has four different wings spread out in approximately 20000 square metre of area. The physical distances between these wings and the number of computer systems to be installed in these wings are given as follows. You as a network expert have to answer the queries as raised by their administrators in (i) to (iv).

Shortest distances between various wings in metres :

YOGA wing to ADMIN wing	50
YOGA wing to HOSTEL wing	70
YOGA wing to MEDITATION wing	50
ADMIN wing to HOSTEL wing	60
ADMIN wing to MEDITATION wing	100
HOSTEL wing to MEDITATION wing	70

Number of Computers installed at various locations are as follows :

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HOSTEL	20
ADMIN	110
MEDITATION	45
YOGA	50



- (i) Suggest the most suitable wing out of the four to install the main server of this centre to get efficient connectivity.
- (ii) Suggest by drawing the best cable layout for effective wing to wing network connectivity of all the wings of this centre.
- (iii) Suggest, which device will be best suited for connecting multiple computer systems installed in each of the wings out of the following : 1
 - Modem
 - Switch
 - Gateway
 - Router
- (iv) Suggest best communication medium to provide most efficient and effective connectivity between the wings out of the following : 1

Co-axial Cable, Ethernet Cable, Optical Fibre, Single Pair Telephone Cable.



EXAMINATION 2019 -