

SAMPLE PAPER-2015
Class-XII
SUB:-COMPUTER SCIENCE

MAX.MARKS: 70

DURATION : 3 Hrs.

1. a) Observe the program segment given below carefully, and answer the question that follows. [1]

```
class Book
{ int Book_no ;
char Book_name[20] ;
public ;          //function to enter Book details
void enterdetails() ; //function to display Book details
void showdetails() ; //function to return Book_no
int Rbook_no() {return Book_no ;}
} ; void Modify (Book NEW)
{ fstream File ;
File.open(.BOOK.DAT., ios :: binary | ios :: in | ios :: out) ;
Book OB ;
int Record = 0, Found = 0 ;
while (!Found && File.read((char*) &OB, sizeof(OB) ))
{ Recordsread++ ;
if (NEW.RBook_no() == OB.RBook_no())
{ _____ //Missing Statement
File.write((char*) &NEW, size of(NEW)) ;
Found = 1 ;
}
else
File.write((char*) &OB, sizeof(OB)) ;
}
```

```

    if (!Found)
        cout << "Record for modification does not exist. ";
    File.close( );
}

```

If the function Modify() is supposed to modify a record in file BOOK.DAT with the values of Book NEW passed to its argument, write the appropriate statement for **Missing Statement** using seekp() or seekg(), whichever needed, in the above code that would write the modified record at its proper place.

b) Write a function in C++ to count and display the number of lines starting with alphabet .A. present in a text file "LINES.TXT" .

[2]

Example :

If the file .LINES.TXT. contains the following lines,

A boy is playing there.

There is a playground.

An aeroplane is in the sky.

Alphabets and numbers are allowed in the password.

The function should display the output as 3

c) Given a binary file STUDENT.DAT, containing records of the following class

Student type

[3]

```
class Student
```

```
{ char S_Admno[10]; //Admission number of student
```

```
char S_Name[30]; //Name of student
```

```
int Percentage; //Marks Percentage of student
```

```
public :
```

```
void EnterData( )
```

```
{ gets(S_Admno); gets(S_Name); cin >> Percentage ;
```

```
}
```

```
void DisplayData( )
```

```
{ cout << setw(12) << S_Admno ;
```

```
cout << setw(32) << S_Name ;
```

```

cout << setw(3) << Percentage << endl ;
}
int ReturnPercentage( ) {return Percentage ;}
};

```

Write a function in C++, that would read contents of file STUDENT.DAT and display the details of those Students whose Percentage is above 95.

2.a) Observe the program segment given below carefully , and answer the question that follows : [1]

```

class Member
{ int Member_no ;
char Member_name[20] ;
public :
//function to enter Member details
void enterdetails ( ) ;
//function to display Member details
void showdetails ( ) ;
//function to return Member_no
int RMember_no( ) {return Member_no ;}
};
void Update (Member NEW)
{ fstream File ;
File.open(.MEMBER.DAT. , ios :: binary | ios :: in | ios :: out) ;
Member OM ;
int Recordsread = 0, Found = 0 ;
while (!Found && File.read((char*) & OM, sizeof(OM)))
{ Recordsread++ ;
if (NEW.RMember_no( ) == OM.RMember_no( ))
{ _____ //Missing Statement
File.write((char*) & NEW , sizeof(NEW) ;
Found = 1 ;
}
}

```

```

else
File.write((char*) & OM, sizeof(OM)) ;
}
if (!Found)
cout<<".Record for modification does not exist. ;
File.close( ) ;
}

```

If the function Update() is supposed to modify a record in file MEMBER.DAT with the values of Member NEW passed to its argument, write the appropriate statement for **Missing statement** using seekp() or seekg(), whichever needed, in the above code that would write the modified record at its proper place.

2.b) Write a function in C++ to count and display the number of lines not starting with alphabet .A. present in a text file " STORY.TXT".

[2]

Example :

If the file .STORY.TXT. contains the following lines,

The rose is red.

A girl is playing there.

There is a playground.

An aeroplane is in the sky.

Numbers are not allowed in the password.

The function should display the output as 3

c) Assuming that a text file named FIRST.TXT contains some text written into it, write a function named **vowelwords()**, that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those **words** from the file

[2]

FIRST.TXT which start with start with a lowercase vowel (i.e. with .a., .e., .l., .o.,.u).

For example if the file FIRST.TXT contains

Carry umbrella and overcoat when it rains

Then the file SECOND.TXT shall contain:

umbrella and overcoat it

3.a) Write a function **readfile()** to read all the records present in already existing binary file SHIP.DAT and display them on the screen, also count the number of records present in the file.

[2]

b) Write a user defined function in C++ to read the content from a text file NOTES.TXT, count and display the number of blank spaces present in it.

[2]

c) Assuming a binary file FUN.DAT is containing objects belonging to a class LAUGHTER (as defined below). Write a user defined function in C++ to add more objects belonging to class LAUGHTER at the bottom of it.

[3]

```
class LAUGHTER
{ int Idno; // Identification number
  char Type[5]; // LAUGHTER Type
  char Desc[255]; // Description
public :
  void Newentry( )
  { cin >> Idno; gets(Type); gets(Desc); }
  void Showonscreen( )
  { cout << Idno << ". : " << Type << endl << Desc << endl; }
```

d) What is the difference between pub() and write()?

[1]

4.a) Write a function in C++, which accepts an integer array and its size as parameters and rearranges the array in reverse.

[2]

Example: If an array of nine elements initially contains the elements as 4, 2, 5, 1, 6, 7, 8, 12, 10

Then the function should rearrange the array as 10, 12, 8, 7, 6,

1, 5, 2, 4

b) An array $\text{Arr}[40][10]$ is stored in the memory along the column with each element occupying 4 bytes. Find out the base address of the location $\text{Arr}[3][6]$ if the location $\text{Arr}[30][10]$ is stored at the address 9000. [3]

c) Write a function in C++ to print the product of each column of a two dimensional array passed as the arguments of the function. [2]

Example : If the two dimensional array contains

Then the output should appear as:

Product of Column 1 = 24

Product of Column 2 = 30

Product of Column 3 = 240

5 .a) Write a function in C++, which accepts an integer array and its size as arguments and swap the elements of every even location with its following odd location. [2]

Example : If an array of nine elements initially contains the elements as

2,4,1,6,5,7,9,23,10

then the function should rearrange the array as

4,2,6,1,7,5,23,9,10

b) An array $\text{Arr}[50][10]$ is stored in the memory along the column with each element occupying 2 bytes. Find out the Base address of the location $\text{Arr}[20][50]$, if the location $\text{Arr}[10][25]$ is stored at the address 10000. [3]

c) Write a function in C++ to print the product of each row of a two dimensional array passed as the arguments of the function [2]

Example: if the two dimensional array contains

Then the output should appear as:

Product of Row 1 = 8000

Product of Row 2 = 6000

Product of Row 3 = 3600

Product of Row 4 = 2400

6. a) An array `Array[20][15]` is stored in the memory along the **column** with each element occupying 8 bytes. Find out the base address of the element `Array[2][3]` if the element `Array[4][5]` is stored at the address 1000. [3]

b) Write a function in C++ which accepts an integer array and its size as arguments and replaces elements having even values with its half and elements having odd values with twice its value. [2]

Example : If an array of five elements initially contains the elements as 3, 4, 5, 16, 9 then the function should rearrange content of the array as 6, 2, 10, 8, 18

c) Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements of middle row and the elements of middle column. [Assuming the 2D Array to be a square matrix with odd dimension i.e., 3x3, 5x5, 7x7 etc.] [2]

Example : If the array content is

3	5	4
7	6	9
2	1	8

Output through the function should be :

Middle Row : 7 6 9

Middle Column : 5 6 1

d) Write function in C++ which accepts an integer array and size as arguments and assign values into a 2D array of integers in the following format : [2]

If the array is 1, 2, 3, 4, 5, 6

The resultant 2D array is given below :

1 0 0 0 0 0

1 2 0 0 0 0

1 2 3 0 0 0

1 2 3 4 0 0

1 2 3 4 5 0

1 2 3 4 5 6

If the array is 1, 2, 3

The resultant 2D array is given :

1 0 0

1 2 0

1 2 3

e) Write a function in C++ which accepts an integer array and its size as arguments and exchanges the values of first half side elements with the second half side elements of the array. [3]

Example :

If an array of 8 elements initial content as 2, 4, 1, 6, 7, 9, 23, 10

The function should rearrange array as 7, 9, 23, 10, 2, 4, 1, 6

f) . Suppose A, B, C are arrays of integers of size M, N and M+N respectively. The numbers in array A appear in ascending order while numbers in array in descending order. Write user defined function in C++ to produce third array C by merging array A by B in ascending order. Use A, B and C as arguments in the function. [2]

7. The Cyber Mind Organization has set up its new Branch at Mizoram for its office and web based activities. It has 4Wings of buildings as shown in the diagram: [4]

Center to center distances between various blocks

Wing X to Wing Z 40 m

Wing Z to Wing Y 60 m

Wing Y to Wing X 135 m

Wing Y to Wing U 70 m

Wing X to Wing U 165 m

Wing Z to Wing U 80 m

Number of computers:

Wing X 50

Wing Z 130

Wing Y 40

Wing U 15

1) Suggest a most suitable cable layout of connections between the Wings, and topology

2) Suggest the most suitable place (i.e., Wing) to house the server of this organization with a suitable reason, with justification.

3) Suggest the placement of the following devices with justification: 1m

(i) Repeater (ii) Hub/Switch

4) The organization is planning to link its head office situated in Delhi with the offices at Srinagar. 1m Suggest an economic way to connect it; the company is ready to compromise on the speed of connectivity. Justify your answer.

8.

a) What are repeaters? [1]

b) What is the difference between LAN and MAN? [1]

c) What is called MOSAIC ? [1]

d) What do you understand by a backbone network? [1]

e) Expand: ARPANET, FLOSS, GNU, ASP [2]

f) What is (a) web 2.0 and (b) Proprietary software ? [2]

9.(a) Minimise $F(w,x,y,z)$ using Karnaugh map.

$F(w,x,y,z) = \Sigma(0,4,8,12)$ [3]

(b) Reduce the following Boolean expression using K . Map :

$F(P, Q, R, S) = \Sigma(0,3,5,6,7,11,12,15)$ [3]

c. Obtain simplified form for a boolean expression

$F(x,y,z,w) = \Sigma(1,3,4,5,7,9,11,12,13,15)$ using Karnaugh Map.

[3]

d. What is called redundant group in K-Map? [1]