

- Instructions: (i) All questions are compulsory.
(ii) Programming language: C++

1. a) Find the output of the following program:

[3]

```
#include<iostream.h>
void ChangetheContent(intArr[], int Count)
{
for(int C=0; C<Count; C++)
Arr[C]=Arr[Count - C - 1];
}
void main()
{
int A[]= {1, 2, 3}, B[] = {20, 30, 40, 50}, C[]= {100, 200};
ChangetheContent(A,3);
ChangetheContent(B,4);
ChangetheContent(C,2);
for(int L=0; L<3; L++) cout<<A[L]<<'#';
cout<<endl;
for(int L=0; L<4; L++) cout<<B[L]<<'#';
cout<<endl;
for(int L=0; L<2; L++) cout<<C[L]<<'#';
cout<<endl;
}
```

b) Study the following program and select the possible output from it:

[2]

```
#include<iostream.h>
#include<stdlib.h>
constint LIMIT = 4;
void main()
{
randomize();
int Points;
Points= 100 + random(LIMIT);
for(int P=Points; P>=100; P--)
cout<<P<<'#';
cout<<endl;
}
```

- (i) 103#102#101#100#
(ii) 100#101#102#103#
(iii) 104#103#102#101#
(iv) 103#102#101#100

c) Find the output of the following program

[3]

```
#include<iostream.h>
#include<ctype.h>
void main()
{
char Text[ ] = "Mind@Work!";
for(inti=0 ; Text[i]!='\0' ; i++)
{
if(!isalpha(Text[i]))
Text[i]= '*';
else if (isupper(Text[i]))
Text[ i]=Text[i]+1;
else
Text[i]=Text[i+1];
}
cout<<Text;
}
```

d). Find the correct possible output(s)

[2]

```
#include<stdlib.h>
#include<iostream.h>
void main()
{
```

```

randomize();
char city[ ][20]={“PKD”, “EKM”, ”TVM”, “KOL”, “CAL”};
int ZEN;
for(inti=0;i<3;i++);
{
ZEN=random(2)+1;
cout<<city[ZEN]<<”@”};
}
}

```

- (i) PKD@ EKM @TVM@
(ii) EKM @TVM@ EKM @
(iii) TVM@KOL@CAL@
(iv) TVM@ EKM @TVM@

e) When a function is overloaded, there are multiple definitions of the functions. What makes the various definitions of the function different from each other? [1]

f) Which C++ header file(s) will be essentially required to run/execute the following C++ code? [2]

```

void main()
{
intRno=465;
charSName1[40], SName[]= “Ajay Bhaskar”;
strcpy (SName1, SName)
cout<<setw(6) <<Rno<<setw(25)<<SName<<endl;
exit(0);
}

```

g) Rewrite the following program after removing the syntactical errors (if any). Underline each correction. [2]

```

i. #include<iostream.h>
struct Screen
{ int C, R;}
voidShowPoint(Screen P)
{
cout<<P.C, P.R<<endl;
}
void main()
{
Screen Point1 = (5, 3);
ShowPoint(Point1);
Screen Point2= point1;
C.Point1+= 2;
Point1.R = Point1.R + 2;
}

```

ii. #include<iostream.h> [2]

```

#include<stdio.h>
void main()
{
structemp
{
charemp_name[15];
charemp_no;
int salary = 5000;
}EMPLOYEE;
gets(emp_name);
gets(emp_no);
}

```

iii. class student [3]

```

{
intrno=100;
char class[20];
PUBLIC; void INPUT()
{
cin>>rno;
gets(class);
}
void OUTPUT()
}

```

```

cout<<rno<<class;
}
};
void main()
{
student s1;
cout<<s1.rno;
INPUT().s1;
}

```

2. a) Define a class BOOK with the following specifications. [4]

Private members

BOOK_NO integer type

BOOK_TITLE 20 Characters

PRICE float(price per copy)

TOTAL_COST() A function to calculate the total cost for N number of copies, Where N is passed to the function as argument

Public members

INPUT() Function to read BOO_NO, BOOK_TITLE, PRICE

PURCHASE() Function to ask the user to input the number of copies to be purchased. It invokes TOTAL_COST() and prints the total cost to be paid by the user.

Note: You are also required to give detailed function definitions.

(Write the complete program)

b) Write any two difference between the following : [4]

i. private and public access specifier

ii. Classes and Objects

c) Define a class Sports in C++ with following descriptions: [4]

Private members:

- S_Code of type long
- S_Name of type character array (String)
- Fees of type integer
- Duration of type integer

Public members:

- A function NewSports() which allows user to enter S_Code, S_Name and Duration. Also assign the values to Fees as per the following conditions:

S_Name Fees

Table Tennis 2000

Swimming 4000

Football 3000

- A function DisplaySports() to display all the details.

(Write the complete program)

3.a) Write a function **Get1from2()** function in C++ to transfer the content from two arrays First[] and Second[] to array All[]. The even places (0,2,4....) of array All[] should get the contents from the array First[] and odd places (1,3,5....)of the array All[] should get the contents from the array Second[] [3]

Eg:

If the First [] array contains 30, 60,90,
And the Second [] array contains 10, 50,80,
Then All [] array should contain 30, 10, 60,50,90,80.

b) Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements which lie on diagonals. [3]

[Assuming the 2D array to be square matrix with odd dimension i.e. 3*3, 5*5, 7*7 etc....]

Eg: 5 4 3

6 7 8

1 2 9

Output through the function should be :

Diagonal one : 5 7 9

Diagonal two : 3 7 1

c) An array MAT[10][11] is stored in the memory row wise with each element occupying 4 bytes of memory. Find out the base address and the address of element MAT[5][10], if the location of MAT[1][4] is stored at the address 2000. [3]

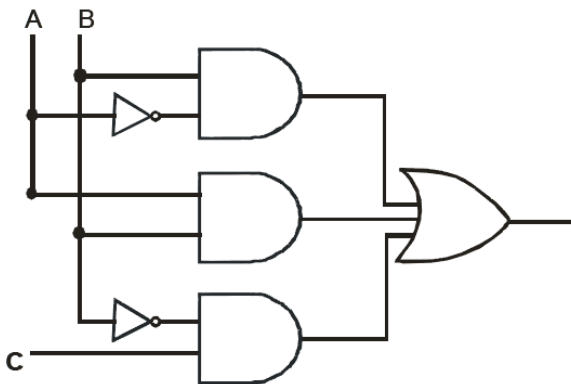
Building 4 to Building 55 30m

Number of Computers in each building:

- Building 1 40
- Building 2 45
- Building 3 110
- Building 4 60
- Building 5 70

- (i) Suggest a cable layout for connecting all the buildings together.
- (ii) Suggest the most suitable building to install the server of the organization with a suitable reason.
- (iii) Building 3 is used for many critical operations. It is tried that PC gets maximum possible bandwidth. Which network device is/should be used for this?
- (iv) The organization also has another office in same city but at a distant location about 25-30 Km away. How can link be established with building 1. (Suggest the transmission media).

6. c) Write the equivalent Boolean Expression F for the following *circuit diagram* : [2]



- d) Reduce the following Boolean Expression using K-map: [3]
 $F(X, Y, Z, W) = \sum(0,1,3,4,5,7,9,10,11,13,15)$
- a) Verify demorgan's law (any one) using algebraic method. [2]
- b) Convert the following Boolean expression into its equivalent Canonical Product of Sum form: [1]
 $X.Y'.Z+X'.Y.Z+X'Y.Z'$

-x-x-x-x-x-