

Q. 1. Define any two features of OOPs. Also give suitable example in C++.

Q. 2. (a) Name the Header file(s) that shall be needed for successful compilation of the

following C++ code

```
void main()
{
int a[10];
for(int i=0;i<10;i++)
{
cin>>a[i];
if(a[i]%2==0)
a[i]=pow(a[i],3);
else
a[i]=sqrt(a[i]);
if(a[i]>32767)
exit(0);
}
getch();
}
```

(b). Rewrite the following program after removing syntactical error(s) if any. Underline each correction.

```
#include
type def int integer;
struct number
{
integer a [5];
}
void main()
{
number x;
for(int i=0;i<5;i++)
cin>>x[i].a;
getch();
}
```

(c). Find the output of the following program :

```
#include
#include
void main()
{
char *a[2]={”Amit”,”Sumit”};
for(int i=0;i<2;i++)
{
int l=strlen(a[i]);
for(int j=0;j
cout<<*a[i]<<” : “;
```

```
cout<
}
}
```

(d). Find the output of the following program

```
#include
class student
{
public:
student()
{
cout<<"\n Computer Science";
}
~student()
{
cout<<" subject";
}
}st;
void main()
{
cout<<" is my best"
}
```

(e). In the following C++ program , what will the maximum and minimum value of r generated with the help of random function.

```
#include
#include
void main()
{
int r;

randomize();
r=random(20)+random(2);
cout<
}
```

(f) Define macro with a suitable example.

Q. 2. (a). Differentiate between a Constructor and Destructor in context of class and object . Give suitable example in C++.

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

```
{
char C_name[20];
char Config[100];
public:
Computer(Computer &obj); // function1
Computer(); //function 2
```

```
Computer(char *n,char *C); // function3  
};
```

- a. Complete the definition of the function 1.
- b. Name the specific feature of the OOPs shown in the above example.

(c). Define a class Student in C++ with the description given below :

private members
rno integer
name array of 40 characters
address array of 40 characters
marks array of 5 integers
percentage float variable
calper() a function which will calculate & return the percentage of a student.

public members

init() function to ask and store the values of rno, name, address and marks in 5 subjects.
display() function to which will invoke calper () and display the details of the item in the following format :

MARK SHEET

Roll No :

Name :

Address :

Marks : <....subject 5 marks>

Percentage :

Also create main() function which will invoke all the public member functions.

(d). Answer the questions (i) to (iv) based on the following code :

```
class Employee  
{  
int id;  
protected :  
char name[20];  
char doj[20];  
public :  
Employee();  
~Employee();  
void get();  
void show();  
};  
class Daily_wager : protected Employee  
{  
int wphour;
```

```

protected :
int nofhworkeed;
public :
void getd();
void showd();
};
class Payment : private Daily_wager
{

char date[10];
protected :
int amount;
public :
Payment();
~Payment();
void show();
};

```

- i. Name the type of Inheritance depicted in the above example.
- ii. Name the member functions accessible through the object of class Payment.
- iii. From the following, Identify the member function(s) that can be called directly from the object of class Daily_wager class
 - show()
 - getd()
 - get()
- iv. Name the base & derived class of Daily_wager class.

Q. 3. (a) Write a function in C++ which accepts a integer array and its size as an arguments and prints the output (using nested loops) in following format :

Example : if the array is having
1 2 4 5 9

Then the output should be

```

1
2 2
4 4 4 4
5 5 5 5 5
9 9 9 9 9

```

(b). An array A[10][20] is stored in the memory with each element occupying 2 bytes of storage. If the Base address of array in the memory is 800 , determine the location of A[9][10] when the array is stored as (i) Row Major (ii) column major.

(c). Write a function in C++ to delete a node containing names of student , from a dynamically allocated Queue of names implemented with the help of following structure :

```

struct student
{

```

```
char name[20];
student *next;

}*front , *rear;
```

(d). Consider the following portion of a program , which implements a linked

stack for Library . Write the definition of function PUSH(),to insert a new node in the stack with required information struct Library

```
{
int id;
char names[20];
};
class stack
{
Library *top;
public :
stack()
{
top=NULL;
}
void PUSH();
void POP();
};
```

(e). Convert the following infix expression into postfix. show the stack status after execution of each operation:

TRUE OR FALSE AND NOT FALSE OR FALSE

Q. 4. (a). Differentiate between ios::app and ios::ate file opening modes.

(b). Write a function in C++ which will print the size of a text file “story.txt” in the form of bytes.

(c). Write a function in C++ which will increase the qty of a particular type of item from the file “stock.dat” . Assuming that the binary file is containing the records of following structure :

```
struct Products
{
int id;
char Iname[30];
int type;
int qty;
};
```

Accept the item type from user whose qty has to be increased.

Q. 5. (a). What do you understand by Primary Key

(b). Consider the following tables Employee and salary. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii)

Table : Employee

Eid	Name	Deptid	Qualification	Sex
1	Deepali Gupta	101	MCA	F
2	Rajat Tyagi	101	BCA	M
3	Hari Mohan	102	B.A	M
4	Harry	102	M.A	M
5	Sumit Mittal	103	B.Tech	M
6	Jyoti	101	M.Tech	F

Table : Salary

Eid	Basic	DA	HRA	Bonus
1	6000	2000	2300	200
2	2000	300	300	30
3	1000	300	300	40
4	1500	390	490	30
5	8000	900	900	80
6	10000	300	490	89

- To display the frequency of employees department wise.
- To list the names of those employees only whose name starts with 'H'
- To add a new column in salary table . the column name is total_sal.
- To store the corresponding values in the total_sal column.
- Select name from employee where eid=(select eid from salary where basic= (select max(basic) from salary));
- select max(basic) from salary where bonus >40;
- Select count(*) from employee group by sex;
- select Distinct deptid from Employee;

Q. 6. (a) State and prove the Distributive law algebraically.

(b). Write the equivalent POS expression of following SOP form

$$F(x,y,z) = \sum (0,2,4,6)$$

(c). Draw the Logical circuit of the following expression with the help of NAND gate only

$$x+yz$$

(d). Obtain the simplified form of a Boolean expression using K-Map.

$$F(a,b,c,d)=\sum(0,1,2,3,4,7,11,12,14)$$

Q. 7. (a). What do you understand by Hackers?

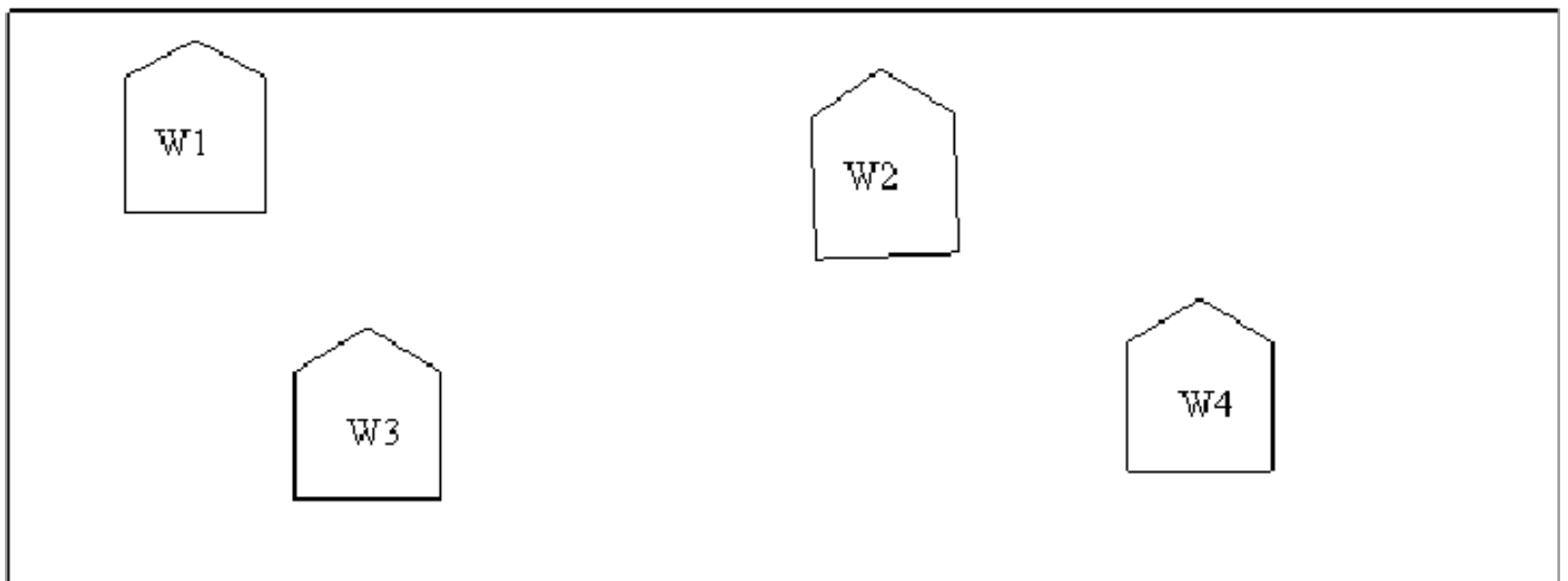
(b). Differentiate between Internet & Intranet

(c). Expand the following terminology :

1. SMS
2. FTP

(d). Define Repeater.

(e). A company in Reliance has 4 wings of buildings as shown in the [diagram](#):



Center to center distances between various Buildings:

W3 to W1 50m

W1 to W2 60m

W2 to W4 25m

W4 to W3 170m

W3 to W2 125m

W1 to W4 90m

Number of computers in each of the wing:

W1 150

W2 15

W3 15

W4 25

Computers in each wing are networked but wings are not networked. The company has now decided to connect the wings also.

- i. Suggest a most suitable cable layout & topology of the connection between the wings.
- ii. The company wants internet accessibility in all the wings. Suggest an economic technology .
- iii. Suggest the placement of the following devices with justification if the company wants minimized network traffic
 - a) Repeater
 - b) Hub
 - c) Switch
 - d) Bridge
- iv. The company is planning to link its head office situated in India with the offices at Reliance. Suggest a way to connect it; the company does not want to compromise with the speed of connectivity. Justify your answer.