



Guru Aanklan

**GRAND
TEST**

**Computer Science - I
Code - [A]**

SOLUTIONS

- 1.(A) (a) (ii) :: (Scope resolution) cannot be overloaded
 (b) (ii) Non-Homogenous
 (c) (i) Process
 (d) (iii) <TABLE >

1.(B) (a) (i) **<MARQUEE> TAG**

MARQUEE, supported only by the Microsoft Internet Explorer 2 (and later) browser, is used to create a scrolling text marquee.

e.g. <MARQUEE ALIGN="top">Scrolling text </MARQUEE>

creates a text marquee with the enclosed text scrolling along the frame.

The another attribute is **DIRECTION** defining direction of the marquee text.

e.g. <MARQUEE DIRECTION="RIGHT">WELCOME</MARQUEE>

So here WELCOME scrolls from left towards right. The default direction is right to left.

But other commercial browsers, including Netscape Navigator, do not support this element.

(ii) **<SUB> tag :**

It is subscript tag. The text enclosed in _{and} is displayed in subscript form.

This is useful in representation of mathematical formulae or chemical equations.

e.g. H₂SO₄

output displayed as :H₂SO₄

(iii) **<BODY>** Defines the document's body

The BODY element contains all the contents of a document

Various mark-up elements are allowed within the body to indicate headings, paragraphs, lists, hypertext links, images, and so on.

Attributes in body tag**(1) The BACKGROUND Attribute**

This allows you to specify an image file to use as a background (a bit like a watermark) behind the displayed text and graphics.

E.g. <BODY BACKGROUND="c:\a.gif">

Text....

</BODY>

So image a.gif will be set as a background to your web page.

(2) Background color of the web page

Attribute is: BGCOLOR="#rrgbb"

Sets the background color to the specified RGB color value, where RR GG and BB are the hexadecimal color codes for the Red, Green and Blue levels, ranging from 0 to 255 — that is, 00 to FF. The color "000000" is black, while "FFFFFF" is white.

(3) Setting the text color(TEXT Attribute)

Syntax: <BODY TEXT="#rrgbb">text in a body</BODY>

Sets the default text color to the specified RGB color value.

(4) Setting color for hyperlinks (LINK Attribute)

Syntax: <BODY LINK="#rrgbb">text in a body</BODY>

Sets the default text color of hypertext anchors to the specified RGB color value.

(5) Setting color for visited hyperlinks (VLINK Attribute)

Syntax: <BODY VLINK="#rrgbb">text in a body</BODY>

- (b) (i) <P> tag : This tag is used to create paragraph text. A paragraph can be created by enclosing text within paragraph tag <p> and </p>. <p> tag has one optional attribute called align.

Example : <P align = left> : Left alignment like normal text.

- (ii)
 tag **inserts a single line break** **Line Breaks: The
 tag is used when you want to end a line, but don't want to start a new paragraph. The
 tag forces a line break wherever you place it. E.g. This
 is line break. So here This and is line break will appear on two different lines. The
 tag is an empty tag. It has no closing tag.**

- (iii) <HR> tag **defines a horizontal rule.**

Used to produce a horizontal line, the width of browser's window. It allows to differentiate sections of your document. SIZE and WIDTH attributes will let you alter the thickness And the percentage of the windows covered by it.

e.g. <BODY>

<H1>This is my first web page</H1>

<HR SIZE=5 WIDTH="20%">

</BODY>

- (c) The data in data structures are processed by certain operations. The operations are as follows:

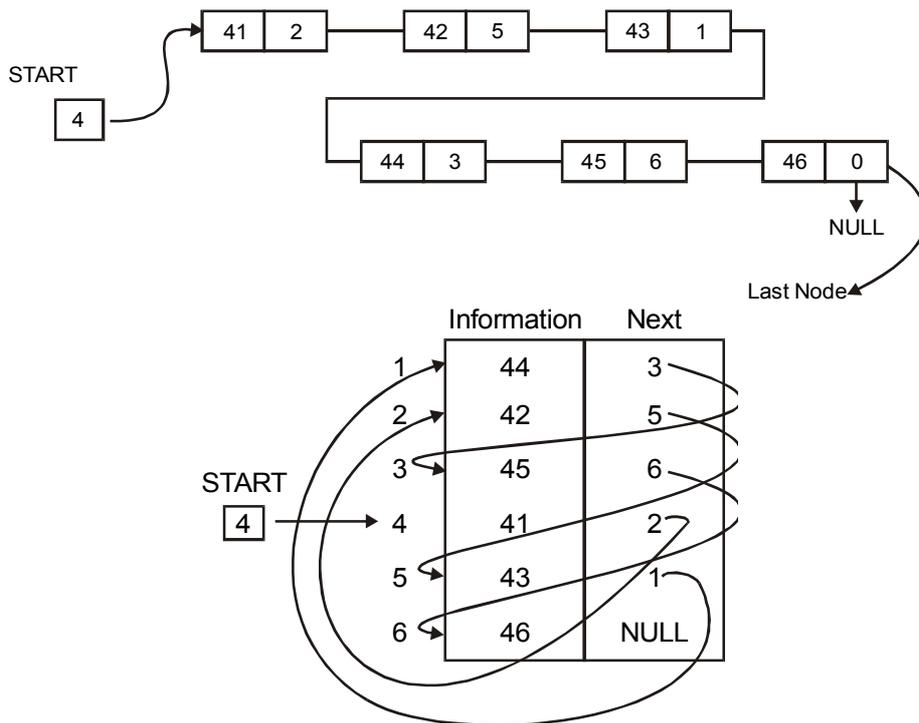
- (i) **Traversing:** Accessing each record exactly once is traversing.
- (ii) **Searching:** Finding the location of a record with a given key value or finding number of records which satisfy one or more conditions.
- (iii) **Insert:** Adding a new record to the structure is called inserting.
- (iv) **Deleting:** Removing a record from a structure is called deleting.
- (v) **Sorting:** Arranging the records in some order is called sorting.
- (vi) **Merging:** Combining the two records in two different sorted files into a single sorted file is called merging.

- Q.2(A) (a) (1) A linked list is a linear collection of data elements called nodes.
 The linear order is given by means of pointers. Each node is divided into two parts:
1. First part contains the information of the element.
 2. Second part contains the address of next node in list (it is called link field).

- (2) START is a pointer variable, which contains the address of first node.

Left part represents the information part of the node while right part represents the next pointer field of node. The pointer of last node contains a special value called NULL, which is an invalid address.

- (3) Diagram:



- (b) (a) **Class** is said to be user-defined data type; which is defined by the user. Users of object-oriented technology usually think of classes as containing the information necessary to create instances, i.e., the structure and capabilities of an instance is determined by its corresponding class.

Classes serve as **templates** for the creation of objects.

- (b) The general form of the class is as shown below:

```

class class_name
{
    access-specifier:
    data and functions
    access-specifier:
    data and functions
    ...
    ...
    
```

access-specifier:

data and functions

} object-list;

Example:

```
class book
{ private:
char bname[20];
int no_of_pages;
float cost;
public:
void read();
void print();
};
```

- (c) C++ is an object oriented programming language. C++ was developed by Bjarne Stroustrup at AT & T Bell Laboratories, USA in the early eighties.

The advantages of C++ are :

1. It is superset of C. Almost all C programs can run in C++ copiler.
2. The facilities of C++ are classes, function overloading, operator overloading.
3. C++ allows user to create abstract data types, to inherit properties from existing data types.
4. C++ supports polymorphism
5. Object oriented libraries can be built by C++.

- Q.2(B) (a)** (i) Programs are divided into **objects**, and different objects communicate with each other through messages, called **methods**.

(ii) Emphasis is given **on data** rather than procedure.

(iii) Data is **hidden** and can't be accessed or altered by external functions.

(iv) Functions operating on data of an object are **encapsulated** (tied together in single data structure called class.)

(v) New data and functions can be easily added whenever necessary.

(vi) Follows bottom-up approach in program design.

- (b)** Visual Display Unit: - Terminal hardware is divided into two parts,

(1) Keyboard: It is used a input medium;

(2) Video Screen: It is used as output medium.

The combination of above two is called as VDU

(i) Dumb Terminal: - It is responsible for basic input and output of data. It does not perform any processing on input data so it is called as dumb terminal.

(ii) Intelligent Terminal: -It has powerful hardware and software. It also performs processing on the data, So it is known as intelligent terminal

Q.3(A) (a) Destructor :

- Destructor is a function that is used to destroy the objects that have been created by a constructor.
- Destructor function name is the same as constructor name with tilde sign.
- Destructor is called as the end of program execution.

Example:

```
class circle
{ private:
int rad;
public:
circle() { rad=5; } // constructor declared and defined
~circle() { delete rad; } // Destructor declared and dfined
};
```

(b) Advantages of HTML

- HTML is an easy to use, learn, implement and flexible alternative to traditional presentation and tedious software.
- HTML documents are device and platform independent. (Since it can be designed to work on not only home PCs but also on graphical workstations, dumb terminals, network computers, hand-held devices etc.)
- You can traverse to any HTML document required because of hyper linking facility available, thus controlled navigation is possible.
- Required HTML pages can be updated easily, without changing whole document.
- Independent work can be done and you need not rely on application or program vendor.
- No expensive license software or hardware required.

Disadvantages of HTML

- HTML doesn't offer programming languages features and capabilities.
- It's easy to write "bad" HTML containing errors.
- Complex HTML code is hard to read and understand and code complexity increases to make interactive web page. So building complex pages is very time consuming.
- It's easy to make mistakes (e.g. leaving out a ">" or "/" character).
- Special types of software like scripting languages (VB Script, Java Script) are required for handling different events and validations.

Can't detect errors easily since no special debugging tool is provided

- (c) Computer Virus:** It is not a complete program by itself. It can not act independently. It is a program written with a clear intention of infecting other programs.

Infection Methods:

- Append:** In this method viral code appends itself to the unaffected program.
- Replace:** In this method viral code replaces original executable program completely or partially.
- Insert:** In this method the viral code is inserted in the body of an executable code to carry out some funny actions.
- Delete:** In this case viral code deletes some codes from executable program.
- Redirect:** In this case the normal control flow of a program is changed to execute some other code.

Q.3(B) (a) To access the data members and member functions it is necessary to define a object of a class. For example:

```
class ratio
{ private :
int x,y;
public:
int z;
void accept();
};
```

The mechanism of accessing data members and member functions inside the main program:

```
Void main()
{
ratio r;          // define object of the class ratio
r.accept();      // Access the member function inside main() program.
r.z = 10;        // As data member is public, it is possible to access.
}
```

The private data members cannot be accessed directly. They can be accessed through member functions. The mechanism of accessing data members and member functions inside the member function of the same class:

```
class ratio
{ private :
int x,y;
public:
int z;
void accept()
{
:cin>>x>>y; // accessing data members
print();     // accessing member function
}
void print();
};
```

The mechanism of accessing data members and member functions inside the member function of another class:

To access member functions inside the member function of another class it is necessary to define that member function as friend.

```
class ratio
{ private :
int x,y;
public:
int z;
friend void print(); // this function can be called anywhere in the program.
// It can be called by another class also
};
```

- (b) Pointer in C++ are used to stored the address of the variable. The memory address of a variable can be accessed in C++ with the help of pointer.

We can define a pointer variable. Store the address of a variable in pointer variable and with the help of & ,* operators we can access memory address of a variable.

Example:

```
int a;           // a is integer type variable
int *p;         // p is pointer to integer
p = &a;         // address of variable is stored in p
cout<<p;        // it will print the content p i.e. address of variable a stored in p
cout<<*p;       // it will print the content of a i.e. value at the address stored in p.
```

Q.4(A) (a) The features of Linux are as follows:-

- 1) Linux is a multi-user operating system with a full set of UNIX compatible tools.
- 2) Linux is network friendly.
- 3) It runs on a wide variety of platforms.
- 4) Linux is free software. Its source code is freely available to everyone. People can copy it, modify it and use it any manner they want.
- 5) Linux is an implementation of the UNIX design philosophy. It obeys UNIX semantics.

(b) Virus detection

- (1) Normally virus detection program checks integrity of binary files. It maintains a checksum on each file. At regular frequency detection program calculates checksum and matches with original one. If there is mismatch then that program may be infected.
- (2) Some programs reside in the memory and continuously monitor memory and I/O operations against virus.

Virus removal

There are some viruses whose bit pattern in the code can be predicted. The virus removal program scans the disk for the patterns of known viruses and on detection it removes them.

Virus prevention

For prevention of virus the user can take the following precautions

- (1) Always buy legal copies of software.
- (2) Take frequent backups of data
- (3) Run monitor programs frequently to detect virus.

(c) Write any three characteristics of friend function?

- a. Answer: It is not in the scope of the class to which it has been declared as friend.
- b. Since it is not in the scope of a class, it cannot be called using the object of that class.
- c. It can be invoked like a normal function without the help of any object.
- d. Unlike member functions, it cannot access the member names directly and has to use an object name and dot membership operator with each member name.
- e. It can be declared either in the public or the private part of a class without affecting its meaning. It has the objects as arguments.

Q.4(B) (a)

No.	Criteria	Computer Worm	Computer Virus
1	Definition	A computer worm is a complete program	A computer virus is not a complete program ,but a part of a program
2	Action	A computer worm can act independently	A computer virus can not act independently.
3	Corruption	It does not cause direct harm to computer system. It just goes on spreading on to network.	It causes direct harm to the computer system corrupts code as well as data.
4	Examples		Boot Sector Virus

(b) (1) **Record:** A record is collection of related data items. Each data item is termed as field. File is collection of similar records. Each data item may be a group item composed of sub items.

(2) **Comparison**

	Record	Linear Array
(1)	A record is a collection of related data items of non homogeneous elements.	A linear array is a list of homogeneous data elements.
(2)	In record the natural ordering of an element is not possible.	In array the natural ordering of an element is possible.
(3)	The elements of record are referenced by level number.	The elements of array are referred by an index set consisting of n consecutive numbers.

Q.5 (a) #include<iostream.h>

```
class convert
{ private:
    float c , f;
public:
    void accept();
    void tempctof();
    void print();
};
void convert::accept()
{ cout<<"Enter temperature in degree centigrade";
cin>>c;
}
void convert::tempctof()
{
f= 9/5*(c+32);
}
```

```

void convert::print()
{
cout<<"Temp. in C = "<<c<<" Converted in F = "<<f;
}
void main()
{
convert c;
c.accept();
c.tempctof();
c.print();
}

```

(b) #include<iostream.h>

```

void main()
{
int a,b;
void swap(int * , int *);
cout<<"Enter two values ";
cin>>a>>b;
cout<<"The Original values are "<<a<<"\t"<<b<<endl;
swap(&a,&b);
cout<<"The Exchanged values are "<<a<<"\t"<<b<<endl;
}
void swap( int *x, int *y)
{
int t;
t=*x;
*x = *y;
*y = t;
}

```

(c) <html>

```

<body >
<table border="2">
<tr colspan="4" align="centre">
<th> STUDENT RECORD </th>
</tr>
<tr align="centre">
<td>YEAR </td>

```

```

<td> BOYS </td>
<td> GIRLS </td>
<td> TOTAL </td>
</tr>
<tr align="centre">
<td> 2010 </td>
<td> 519 </td>
<td> 710 </td>
<td> 1229 </td>
</tr>
<tr align="centre">
<td> 2011 </td>
<td> 800 </td>
<td> 930 </td>
<td> 1730 </td>
</tr>
</table>
</body>
</html>

```

OR

- Q.5** (a) `#include<iostream.h>`
`void main()`
`{`
`int s=0;`
`for(int I= 1; I<=100;I++)`
`s = s + I;`
`cout<<"sum of 100 numbers is "<<s;`
`}`
- (b) `#include<iostream.h>`
`#include<string.h>`
`void main()`
`{`
`char c[80];`
`int i, len, n=0;`
`cout<<"Enter a sentence less than 80 char ";`
`cin.getline(c,80);`
`len = strlen(c);`

```
for ( i = 0 ; i < len ; i++)  
if (c[i] == 'J' )  
n++;  
cout << "The count of J is " << n;  
}
```

Languages

- (c)
1. English
 2. Second Languages ...
 - Marathi
 - Hindi
 - French
 - Sanskrit