

V.M.G.RAJASEKARAN – RAMANI SRI SARADA SAKTHI MAT. HR. SEC. SCHOOL

STD: XI

COMPUTER SCIENCE

VIRUDHUNAGAR DISTRICT

COMMON HALF YEARLY EXAMINATION – DECEMBER 2023

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PART – I

I. ANSWER ALL THE QUESTIONS:

15 X 1 = 15

1. b. RAM

2. b. 11011001

3. c.23

4. a. GUI

5. a. Rick Mascitti

6. d. 4

7. c. \n

8. c. switch

9.c. isalnum()

10. a. (;) semicolon

11. code reusability

12. d. function overloading

13. c. multilevel inheritance

14. b. spam

15. a. Tamizpori

PART – II

II. Answer any 6 of the following and question no. 21 is compulsory:

16. What is the function of memory?

- ❖ The Memory Unit is of two types. Which are primary memory and secondary memory.
- ❖ The primary memory is used to temporarily store the programs and data when the instructions are ready to execute.
- ❖ The secondary memory is used to store the data permanently.

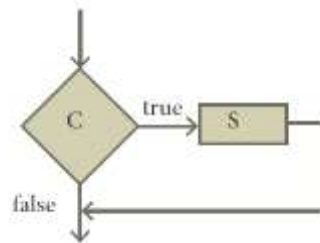
17. Add: $1111101 + 101101 = (10101010)_2$

18. What is a program counter?

The Program Counter (PC) is a special register in the CPU which always keeps the address of the next instruction to be executed.

19. Distinguish between algorithm and a process.

ALGORITHM	PROGRAM
An algorithm is a step-by-step sequence of statements to solve a problem.	A system task, such as sending output to a printer or screen, can also be called as a Process.

20. Draw a flow chart for conditional statement.**21. What is an invariant?**

- ❖ An expression involving variables, which remains unchanged by an assignment to one of these variables, is called an invariant of the assignment.
- ❖ An expression of the variables has the same value before and after an assignment, it is an invariant of the assignment.

22. What is Traversal in an Array?

- ❖ Accessing each element of an array at least once to perform any operation is known as "Traversal".
- ❖ Displaying all the elements in an array is an example of "traversal".

23. Differentiate classes and objects

CLASS	OBJECT
Class is a user defined data type. Class represents group of similar objects.	Objects are the basic unit of OOP. It represents data and associated function together in to a single unit.
Class are share common properties and relationship.	An identifiable entity with some characteristics and behaviour.

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24. What is Encryption?

- ❖ Encryption is the process of translating the plain text data (plaintext) into random and mangled data (called cipher-text).

PART - III

III. Answer ANY 6 questions and question no. 29 is compulsory;

25. Convert $(147)_{10}$ into binary and then convert that binary number to Hexadecimal number.

147/2	=	73	1
73/2	=	36	1
36/2	=	18	0
18/2	=	9	0
9/2	=	4	1
4/2	=	2	0
2/2	=	1	0

$\left. \begin{array}{c} 0110 \\ \hline 6 \end{array} \right\}$
 $\left. \begin{array}{c} 0100 \\ \hline 4 \end{array} \right\}$

$$(147)_{10} = (1100100)_2 = (64)_{16}$$

26. Differentiate PROM and EPROM.

PROM	EPROM
Programmable read only memory is a non-volatile memory on which data can be written only once.	Erasable Programmable Read Only Memory is a special type of memory which serves as a PROM
PROM programmer or a PROM burner is used to write data to a PROM chip.	The content can be erased using ultraviolet rays.

27. How is state represented in algorithm?

- ❖ State is a basic and important abstraction.
- ❖ Computational processes have state.
- ❖ A computational process starts with an initial state.
- ❖ As actions are performed, its state changes.
- ❖ It ends with a final state.
- ❖ State of a process is abstracted by a set of variables in the algorithm.
- ❖ The state at any point of execution is simply the values of the variables at that point.

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28. Tabulate the punctuator used in C++.

Punctuators :

- Punctuators are symbols, which are used as delimiters, while constructing a C++ program.
- They are also called as "Separators".

Ex: Curly braces { } Parenthesis () Square brackets [] Comma , Semicolon ;

29. Write a C++ program to find factorial value of a given number.

```
#include<iostream>
using namespace std;
int main()
{
    int num, i, fact=1;
    cout<<"Enter the Number: ";
    cin>>num;
    for(i=num; i>=1; i--)
        fact = fact*i;
    cout<<"\nFactorial = "<<fact;
    cout<<endl;
    return 0;
}
```

30. Write the purpose of structure definition and usage?

- ❖ Structure is a user-defined which has the combination of data items with different data types.
- ❖ This allows to group variables of mixed data types together into a single unit.
- ❖ The elements are of different data types, If more than one variable is used, they can be stored in memory but not in adjacent locations.
- ❖ The structure provides a facility to store different data types as a part of the same logical element in one memory chunk adjacent to each other.

31. List some features of Modular programming.

Important features of Modular programming

- ❖ Emphasis on algorithm rather than data
- ❖ Programs are divided into individual modules
- ❖ Each modules are independent of each other and have their own local data
- ❖ Modules can work with its own data as well as with the data passed to it.

Example: **Pascal** and **C**

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32. What is phishing?**Phishing :**

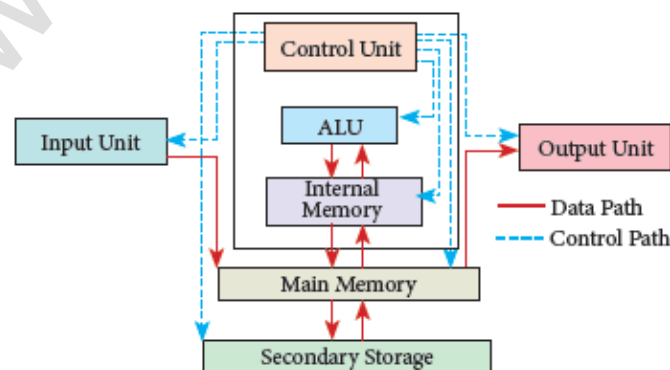
- ❖ Phishing is a type of computer crime used to attack, steal user data, including login name, password and credit card numbers.
- ❖ It occurs when an attacker targets a victim into opening an e-mail or an instant text message.
- ❖ The attacker uses phishing to distribute malicious links or attachments that can perform a variety of functions, including the extraction of sensitive login credentials from victims.

33. Write a short note on Virtual Tamil academy.**Virtual Tamil academy:**

- ❖ With the objectives of spreading Tamil to the entire world through internet, Tamil Virtual University was established on 17th February 2001 by the Govt. of Tamilnadu.
- ❖ Now, this organisation functioning with the name "Tamil Virtual Academy".
- ❖ This organisation offers different courses regarding Tamil language, Culture, heritage etc., from kindergarten to under graduation level.]
- ❖ Website: <http://www.tamilvu.org/index.php>

PART - D**34. Explain the basic components of a computer with a neat diagram.****Basic components of a computer:**

- ❖ The computer is the combination of hardware and software.
- ❖ Hardware is the physical component of a computer like motherboard, memory devices, monitor, keyboard etc.,
- ❖ software is the set of programs or instructions. Both hardware and software together make the computer system to function.



STD: XI**COMPUTER SCIENCE****Input Unit :**

Input unit is used to feed any form of data to the computer, which can be stored in the memory unit for further processing.

Example: Keyboard, mouse,

Central Processing Unit:

- ❖ CPU is the major component which interprets and executes software instructions.
- ❖ It also controls the operation of all other components such as memory, input and output units.
- ❖ It accepts binary data as input process the data according to the instructions and provides the result as output.
- ❖ The CPU has three components which are Control unit, Arithmetic and logic unit (ALU) and Memory unit.

Arithmetic and Logic Unit:

- ❖ The ALU is a part of the CPU where various computing functions are performed on data.
- ❖ The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations.
- ❖ The result of an operation is stored in internal memory of CPU.
- ❖ The logical operations of ALU promote the decision-making ability of a computer.

Control Unit:

- ❖ The control unit controls the flow of data between the CPU, memory and I/O devices.
- ❖ It also controls the entire operation of a computer.

Memory Unit :

- ❖ The Memory Unit is of two types which are primary memory and secondary memory.
- ❖ The primary memory is used to temporarily store the programs and data when the instructions are ready to execute.
- ❖ The secondary memory is used to store the data permanently.

Output Unit:

- ❖ An Output Unit is any hardware component that conveys information to users in an understandable form.

Example: Monitor, Printer etc.

(OR)

a) Write the procedure to convert the given Binary to octal number.

Binary to Octal Conversion

Step 1: Group the given binary number into 3 bits from right to left.

Step 2: You can add preceding 0 to make a group of 3 bits if the left most group has less than 3 bits.

Step 3: Convert equivalent octal value using "2's power positional weight method"

b) Write short notes on ISCII

Indian Standard Code for Information Interchange (ISCII):

- ❖ ISCII is the system of handling the character of Indian local languages.
- ❖ This as a 8-bit coding system.
- ❖ Therefore it can handle 256 (28) characters.
- ❖ This system is formulated by the department of Electronics in India in the year 1986-88 and recognized by Bureau of Indian Standards (BIS).
- ❖ Now this coding system is integrated with Unicode.

35. Explain the process management algorithm in operating system.

Process management technique in Operating system:

- ❖ Process management is function that includes creating and deleting processes providing mechanisms for processes to communicate and synchronize with each other.
- ❖ The Operating System is responsible for the following activities associated with the process management:
- ❖ The following algorithms are mainly used to allocate the job (process) to the processor.

1. FIFO
2. SJF
3. Round Robin
4. Based on Priority

1. FIFO (First In First Out) Scheduling:

- ❖ This algorithm is based on queuing technique.
- ❖ The process that enters the queue first is executed first by the CPU, followed by the next and so on.
- ❖ The processes are executed in the order of the queue (row).

2. SJF (Shortest Job First) Scheduling:

- ❖ This algorithm works based on the size of the job being executed by the CPU.
- ❖ Consider two jobs A and B. 1) A = 6 kilo bytes 2) B = 9 kilo bytes.
- ❖ First the job "A" will be assigned and then job "B" gets its turn.

3. Round Robin Scheduling

- ❖ The Round Robin (RR) scheduling algorithm is designed for time sharing systems.
- ❖ Jobs (processes) are assigned and processor time in a circular method. Example take three jobs A, B, C.
- ❖ First the job A is assigned to CPU then job B and job C and then again A, B and C 4. Based On Priority
- ❖ The given job (process) is assigned based on a Priority.
- ❖ The job which has higher priority is processed first Take two jobs A and B. Let the priority of A be 5 and priority B be 7.
- ❖ Job B is assigned to the processor before job A.

(OR)

Explain the various methods of renaming files and folders in Windows

Operating system.

Using the FILE Menu

1. Select the File or Folder you wish to Rename.
2. Click File → Rename.
3. Type in the new name.
4. To finalise the renaming operation, press Enter

Using the Right Mouse Button

1. Select the file or folder you wish to rename.
2. Click the right mouse button over the file or folder.
3. Select Rename from the pop-up menu.
4. Type in the new name.
5. To finalise the renaming operation, press Enter.
6. The folder "New Folder" is renamed as C++.

Using the Left Mouse Button

1. Select the file or folder you wish to rename.
2. Press F2 or click over the file or folder. A surrounding rectangle will appear around the name.
3. Type in the new name.
4. To finalise the renaming operation, press Enter.

36. What is Expression? Explain.

- ❖ An expression is a combination of operators, constants and variables arranged as per the rules of C++.
- ❖ It may also include function calls which return values. An expression may consist of one or more operands, and zero or more operators to produce a value.
- ❖ In C++, there are seven types of expressions, and they are:
 - (i) Constant Expression
 - (ii) Integer Expression
 - (iii) Floating Expression
 - (iv) Relational Expression
 - (v) Logical Expression
 - (vi) Bitwise Expression
 - (vii) Pointer Expression

SN	Expression	Description	Example
1	Constant Expression	Constant expression consist only constant values	int num=100;
2	Integer Expression	The combination of integer and character values and/or variables with simple arithmetic operators to produce integer results.	sum=num1+num2; avg=sum/5;
3	Float Expression	The combination of floating point values and/or variables with simple arithmetic operators to produce floating point results.	Area=3.14*r*r;
4	Relational Expression	The combination of values and/or variables with relational operators to produce bool(true means 1 or false means 0) values as results.	x>y; a+b==c+d;
5	Logical Expression	The combination of values and/or variables with Logical operators to produce bool values as results.	(a>b)&&(c==10);
6	Bitwise Expression	The combination of values and/or variables with Bitwise operators.	x>>3; a<<2;
7	Pointer Expression	A Pointer is a variable that holds a memory address. Pointer variables are declared using (*) symbol.	int *ptr;

(OR)

Explain the syntax of do....while loop in C++ with example program.

do-while loop:

- ❖ The do-while loop is an exit-controlled loop.
- ❖ In do-while loop, the condition is evaluated at the bottom of the loop after executing the body of the loop.

syntax

```
do
{
Body of the loop;
} while(condition);
```

```
#include <iostream>
using namespace std;
int main ()
{
int n = 10;
do
{
cout<<n<<" ";
n--;
}while (n>0);
}
Output
10, 9, 8, 7, 6, 5, 4, 3, 2, 1
```

37. Explain inline function with suitable example.

- ❖ A function that calls itself is known as recursive function. And, this technique is known as recursion.

Example Program:

```
#include
using namespace std;
int gcd(int n1, int n2)
{ if (n2 != 0) return gcd(n2, n1 % n2);
else return n1; }
int main()
{ int num1, num2;
cout << "Enter two positive integers: ";
cin >> num1 >> num2;
cout << "Greatest Common Divisor (GCD) of :" << num1; cout<< " & " << num2 <<
" is: " << gcd (num1, num2);
return 0;
```

(OR)

Mention the difference between Constructor and Destructor.

Constructor	DESTRUCTOR
The name of the constructor must be same as that of the class.	The Destructor has the same as that of the class prefixed by the Tilde symbol (~).
The constructor function can be overloaded.	The Destructor function can't be overloaded.
A constructor can have parameter (Arguments) list.	The Destructor cannot have parameter (Arguments) list.
Constructor cannot be inherited. But a derived class can call the base class constructor.	Destructor cannot be inherited.
The constructor is executed automatically when the object is created.	The destructor is executed automatically when the control reaches the end of class scope to destroy the object.
Allocated memory space for the objects.	Destroy the object.

38. What are the rules of Operator Overloading?

- ❖ Precedence and Associativity of an operator cannot be changed.
- ❖ No new operators can be created, only existing operators can be overloaded.
- ❖ Cannot redefine the meaning of an operator's procedure. You cannot change how integers are added.
- ❖ Only additional functions can be to an operator
- ❖ Overloaded operators cannot have default arguments.

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- ❖ When binary operators are overloaded, the left hand object must be an object of the relevant class

(OR)

Discuss the different visibility modes through Pictorial Representation.

The accessibility of base class by the derived class is controlled by visibility modes.

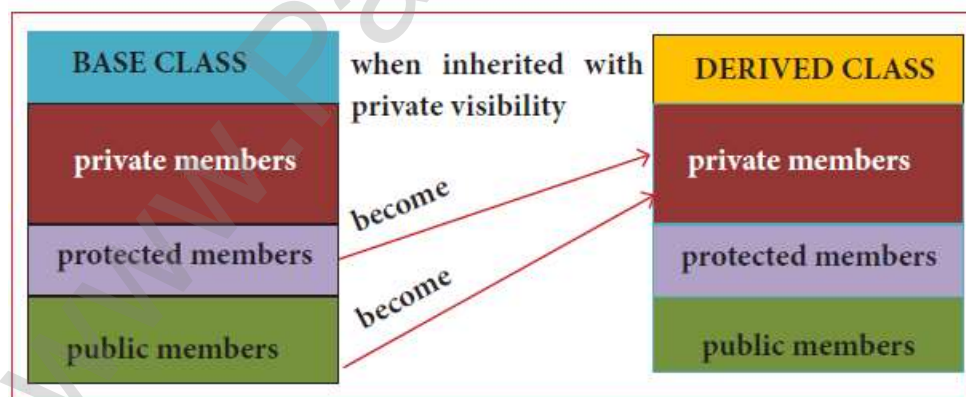
The three visibility modes are private, protected and public.

The default visibility mode is private.

Though visibility modes and access specifies look similar, the main difference between them is Access specifies control the accessibility of the members with in the class where as visibility modes control the access of inherited members with in the class.

1 Private visibility mode

When a base class is inherited with private visibility mode the public and protected members of the base class become 'private' members of the derived class.

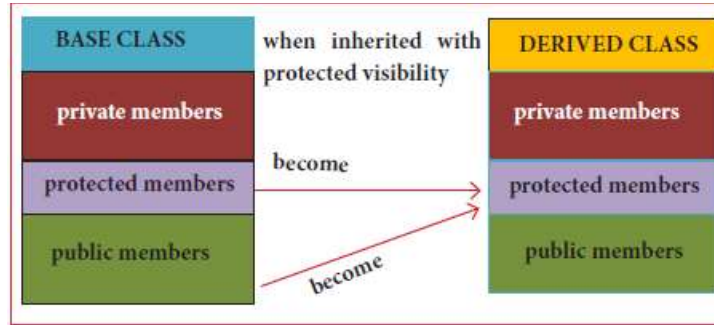


2 protected visibility mode

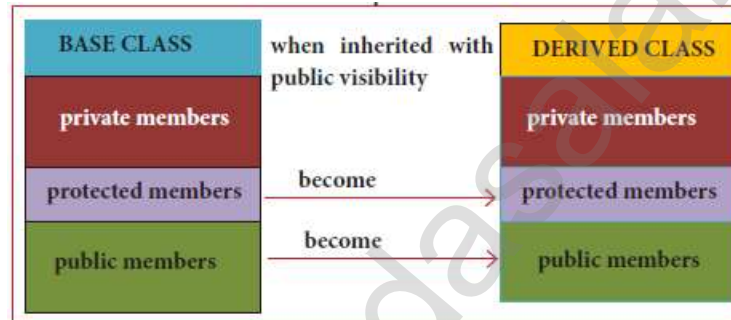
When a base class is inherited with protected visibility mode the protected and public members of the base class become 'protected members' of the derived class.

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**3 public visibility mode**

When a base class is inherited with public visibility mode, the protected members of the base class will be inherited as protected members of the derived class and the public members of the base class will be inherited as public members of the derived class.



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