

STD: XI

COMPUTER SCIENCE

**VIRUDHUNAGAR DISTRICT
COMMON HALF YEARLY EXAMINATION - DECEMBER 2024
STANDARD 11
COMPUTER SCIENCE
PART - I**

I. ANSWER ALL THE QUESTIONS: 15 X 1 = 15

1. a. Vacuum tubes
2. c. Peta
3. c. System software
4. a. F2
5. b. Source code
6. a. Nested loop
7. d. break
8. c. *
9. a. int
10. b. 5
11. b. object
12. d. attributes
13. a. function overloading
14. c. Multilevel inheritance
15. b. warez

PART - II

II. Answer ANY 6 of the following and question no. 22 is compulsory;

1. What is the function of an ALU?

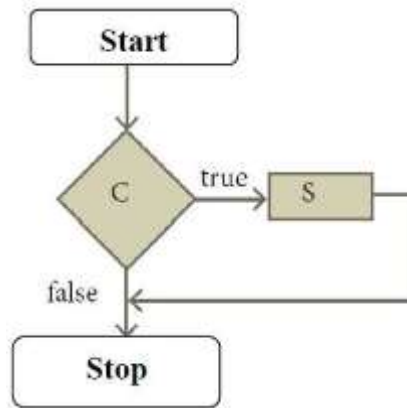
- The ALU is a part of the CPU where various computing functions are performed on data.
- The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations.

17. Binary Addition: $110111 + 10011 = (1001010)_2$

18. Differentiate Save and save as option

Save	Save As
Save command is used to save a file for the first time.	Save As command is used to save a saved file with a different name.

19. Draw a flowchart for conditional statement.



20. What is a reference variable? What is its use?

- A reference provides an alias for a previously defined variable.
- Declaration of a reference consists of base type and an & (ampersand) symbol; Usage:
- Reference variable name is assigned the value of a previously declared variable.

21. What is polymorphism?

- Polymorphism is the ability of a message or function to be displayed in more than one form.

Example: Draw_square() Draw_circle() Draw_rectangle

22. Write a C++ program to add all elements in a (m×n) matrix.

```

#include <iostream>
using namespace std;
int main()
{
    int r, c, a[100][100], b[100][100], sum[100][100], i, j;
    cout << "Enter number of rows (between 1 and 100): ";
    cin >> r;
    cout << "Enter number of columns (between 1 and 100): ";
    cin >> c;
    cout << endl << "Enter elements of 1st matrix: " << endl;
    for(i = 0; i < r; ++i)
        for(j = 0; j < c; ++j)
        {
            cout << "Enter element a" << i + 1 << j + 1 << " : ";
            cin >> a[i][j];
        }
  
```

```
cout << endl << "Enter elements of 2nd matrix: " << endl;
for(i = 0; i < r; ++i)
  for(j = 0; j < c; ++j)
  {
    cout << "Enter element b" << i + 1 << j + 1 << " : ";
    cin >> b[i][j];
  }
for(i = 0; i < r; ++i)
  for(j = 0; j < c; ++j)
    sum[i][j] = a[i][j] + b[i][j];
cout << endl << "Sum of two matrix is: " << endl;
for(i = 0; i < r; ++i)
  for(j = 0; j < c; ++j)
  {
    cout << sum[i][j] << " ";
    if(j == c - 1)
      cout << endl;
  }
return 0; }
```

23. Write down the importance of destructor.

- The purpose of the destructor is to free the resources that the object may have acquired during its lifetime.
- A destructor function removes the memory of an object which was allocated by the constructor at the time of creating a object.

24. Write a short note about Tamil Programming Language.

- Based on Python programming language, the first Tamil programming language "Ezhil" is designed.
- With the help of this programming language, you can write simple programs in Tamil.

PART - III

II. Answer ANY 6 of the following and question no. 29 is compulsory:

25. Write the truth tables of fundamental gates.

AND Gate:

Truth Table		
A	B	AB
0	0	0
0	1	0
1	0	0
1	1	1

OR Gate:

A	B	A + B
0	0	0
0	1	1
1	0	1
1	1	1

NOT Gate:

A	\bar{A}
0	1
1	0

26. Write a note on Multiprocessing.

- Processing takes place in parallel is known as parallel processing.
- Each Processor works on different parts of the same task or on two or more different tasks.
- Since the execution takes place in parallel, this feature is used for high speed execution.

27. When do you say that a problem is algorithmic in nature?

- We usually say that a problem is algorithmic in nature when its solution involves the construction of an algorithm.
- Some types of problems can be immediately recognized as algorithmic.

28. Describe the differences between keywords and identifiers?

KEYWORDS	IDENTIFIERS
Keywords are the reserved words which convey specific meaning to the C++ compiler.	Identifiers are the user-defined names given to different parts of the C++ program
Keywords are the essential elements to construct C++ programs.	These are the fundamental building blocks of a program.
EX: int , void , break , do , if etc.	. EX: variable_name, function_name, array_name, classe_name etc..

29. Write a C++ program to print the following series . 1,4,7,10....40.

```
#include<iostream>
using namespace std;
int main()
{
    int i=1;
    cout<<"Number Series:";
while(i<=40)
    { cout<<'\\t'<< i ;
    i=i+3;
} }
```

30. Write Key Differences Between if-else and switch (Any three).

if-else	switch
Expression inside if statement decide whether to execute the statements inside if block or under else block	expression inside switch statement decide which case to execute
An if-else statement uses multiple statements for multiple choices	switch statement uses single expression for multiple choices
If-else statement checks for equality as well as for logical expression	switch checks only for equality

31. Write note on array of string.

- An array of strings is a two-dimensional character array.
- The size of the first index (rows) denotes the number of strings and the size of the second index (columns) denotes the maximum length of each string.

Declaration of 2D Array:

```
char Name[6][10];
```

Initialization:

```
char Name[6][10] = {"Vijay", "Raji", "Suji", "Joshini", "Murugan", "Mani"};
```

32. What are the rules for function overloading?

- The overloaded function must differ in the number of its arguments or data types.
- The return type of overloaded functions are not considered for overloading same data type.
- The default arguments of overloaded functions are not considered as part of the parameter list in function overloading.

33. Explain about proxy server.







- A proxy server acts as an intermediary between the end users and a web server.
- A client connects to the proxy server, requesting some service, such as a file, connection, web page, or other resources available from a different server.
- The proxy server examines the request, checks authenticity and grants the request based on that.
- Proxy servers typically keep the frequently visited site addresses in its cache which leads to improved response time.

PART - IV

IV. ANSWER ALL THE QUESTIONS;

5 X 5 = 25

34. Discuss the various generations of computers.

SN	Generation	Period	Main Component used	Merits/Demerits
1	First Generation	1942-1955	 Vacuum tubes	<ul style="list-style-type: none"> • Big in size • Consumed more power • Malfunction due to overheat • Machine Language was used
First Generation Computers - ENIAC , EDVAC , UNIVAC 1 ENIAC weighed about 27 tons, size 8 feet × 100 feet × 3 feet and consumed around 150 watts of power				
2	Second Generation	1955-1964	 Transistors	<ul style="list-style-type: none"> • Smaller compared to First Generation • Generated Less Heat • Consumed less power compared to first generation • Punched cards were used • First operating system was developed - Batch Processing and Multiprogramming Operating System • Machine language as well as Assembly language was used.
Second Generation Computers IBM 1401, IBM 1620, UNIVAC 1108				
3	Third Generation	1964-1975	 Integrated Circuits (IC)	<ul style="list-style-type: none"> • Computers were smaller, faster and more reliable • Consumed less power • High Level Languages were used
Third Generation Computers IBM 360 series, Honeywell 6000 series				
4	Fourth Generation	1975-1980	 Microprocessor Very Large Scale	<ul style="list-style-type: none"> • Smaller and Faster • Microcomputer series such as IBM and APPLE were developed • Portable Computers were introduced.
5	Fifth Generation	1980 - till date	 Ultra Large Scale Integration (ULSI)	<ul style="list-style-type: none"> • Parallel Processing • Super conductors • Computers size was drastically reduced. • Can recognize Images and Graphics • Introduction of Artificial Intelligence and Expert Systems • Able to solve high complex problems including decision making and logical reasoning
6	Sixth Generation	In future		<ul style="list-style-type: none"> • Parallel and Distributed computing • Computers have become smarter, faster and smaller • Development of robotics • Natural Language Processing • Development of Voice Recognition Software

OR

Find 1's complement and 2's complement for the following Decimal numbers.

Number	a) -212	b) -76
1's complement	00101011	10110011
2's complement	00101100	10110100

35. Explain the characteristics of a microprocessor.

A Microprocessor's performance depends on the following characteristics:

a) Clock speed b) Instruction set c) Word size

a) Clock Speed

- Every microprocessor has an internal clock that regulates the speed at which it executes instructions.
- The speed at which the microprocessor executes instructions is called the clock speed.
- Clock speed is measured in MHz (Mega Hertz) or in GHz (Giga Hertz).

Instruction Set

- A command which is given to a computer to perform an operation on data is called an instruction.
- Basic set of machine level instructions that a microprocessor is designed to execute is called as an instruction set.
- This instruction set carries out the following types of operations:
 - Data transfer
 - Arithmetic operations
 - Logical operations
 - Control flow
 - Input/output

c) Word Size

- The number of bits that can be processed by a processor in a single instruction is called its word size.
- Word size determines the amount of RAM that can be accessed by a microprocessor at one time and the total number of pins on the microprocessor.
- Total number of input and output pins in turn determines the architecture of the microprocessor.

OR

Explain the different ways of finding a file or Folder**Finding Files and Folders**

You can use the search box on the Start menu to quickly search a particular folder or file in the computer or in a specific drive.

To find a file or folder:

1. Click the Start button, the search box appears at the bottom of the start menu.
2. Type the name of the file or the folder you want to search. Even if you give the part of the file or folder name, it will display the list of files or folders starting with the specified name.
3. The files or the folders with the specified names will appear, if you click that file, it will directly open that file or the folder.
4. There is another option called "See more results" which appears above the search box.
5. If you click it, it will lead you to a Search Results dialog box where you can click and open that file or the folder.

Searching Files or folders using Computer icon

1. Click Computer Icon from desktop or from Start menu.
2. The Computer disk drive screen will appear and at the top right corner of that screen, there is a search box option.
3. Type the name of the file or the folder you want to search. Even if you give the part of the file or folder name, it will display the list of files or folders starting with the specified name. Write the procedure to create shortcut in Windows OS.
4. Just click and open that file or the folder.

36. Explain control statement with suitable example.

- Control statements are statements that alter the sequence of flow of instructions.
- In a program, statements may be executed sequentially, selectively or iteratively.
- If the Statements are executed sequentially, the flow is called as sequential flow.
- If the statements alter the flow of execution like branching, iteration, jumping and function calls, this flow is called as control flow.
- The **sequential statement** are the statements, that are executed one after another only once from top to bottom.
- These statements do not alter the flow of execution. These statements

are called as sequential flow statements. They are always end with a semicolon (;).

➤ **The selection statement** means the statement (s) are executed depends upon a condition. If a condition is true, a true block (a set of statements) is executed otherwise a false block is executed. This statement is also called **decision statement** or **selection statement**.

➤ **Iteration Statement (looping)** is use to execute a set of statements repeatedly until a condition is satisfied.

➤ If a condition evaluates to true, the set of statements (true block) is executed again and again.

➤ This is also known as **looping statement** or iteration statement.

OR

Write a C++ program to accept any integer number and reverse it.

```
#include <iostream>
using namespace std;
int main() {
    int n, reversed_number = 0, remainder;
    cout << "Enter an integer: ";
    cin >> n;
    while(n != 0) {
        remainder = n % 10;
        reversed_number = reversed_number * 10 + remainder;
        n /= 10;
    }
    cout << "Reversed Number = " << reversed_number;
    return 0;
}
```

OUTPUT:

```
Enter an integer: 524
Reversed Number = 425
```

37. Explain inline function with suitable example.

An **inline** function looks like normal function in the source file but inserts the function's code directly into the calling program. To make a function inline, one has to insert the keyword **inline** in the function header.

Syntax :

```
inline returntype functionname(datatype parameter 1, ... datatype parameter n)
```

Advantages of inline functions:

Inline functions execute faster but requires more memory space.

Reduce the complexity of using STACKS.

```
#include <iostream>
using namespace std;
inline int add (int a , int b)
{
    int c=a+b;
    return(c);
}
int main ()
{
    int x,y,z;
    cout<<"\nEnter the First Number :";
    cin>>x;
    cout<<"\nEnter the second Number  :";
    cin>>y;
    z=add(x,y);
    cout << "\n sum of "<<x<<"+"<<y<< "="<<z;
    return 0;
}
```

Output:

```
Enter the First Number :10
Enter the second Number :20
sum of 10+20=30
```

OR

Write a note on the basic concepts that support OOPs?

The Object Oriented Programming has been developed to overcome the drawbacks of procedural and modular programming.

It is widely accepted that object-oriented programming is the most important and powerful way of creating software.

The Object-Oriented Programming approach mainly encourages:

Modularisation:

where the program can be decomposed into modules.

Software re-use:

where a program can be composed from existing and new modules.

Main Features of Object Oriented Programming

Data Abstraction

Encapsulation

Modularity

Inheritance

Polymorphism

1. Encapsulation

- The mechanism by which the data and functions are bound together into a single unit is known as Encapsulation.
- This encapsulation of data from direct access by the program is called data hiding or information hiding.

2. Data Abstraction

- Abstraction refers to showing only the essential features without revealing background details.
- Classes use the concept of abstraction to define a list of abstract attributes and function which operate on these attributes.

3. Modularity

- Modularity is designing a system that is divided into a set of functional units (named modules) that can be composed into a larger application.

4. Inheritance

- Inheritance is the technique of building new classes (derived class) from an existing Class (base class).
- The most important advantage of inheritance is code reusability.

5. Polymorphism

- Polymorphism is the ability of a message or function to be displayed in more than one form.

38. What are the various crimes happening using computer?

- Cybercrime is an intellectual, white-collar crime.
- Those who commit such crimes generally manipulate the computer system in an intelligent manner.

For example - illegal money transfer via internet.

Examples of some Computer crimes and their functions are listed below following table.

Crime	Function
Cyber Terrorism	Hacking, threats, and blackmailing towards a business or a person.
Cyber stalking	Harassing through online.
Malware	Malicious programs that can perform a variety of functions including stealing, encrypting or deleting sensitive data, altering or hijacking core computing functions and monitoring user's computer activity without their permission.
Denial of service attack	Overloading a system with fake requests so that it cannot serve normal legitimate requests.
Fraud	Manipulating data, for example changing the banking records to transfer money to an unauthorized account.
Harvesting	A person or program collects login and password information from a legitimate user to illegally gain access to others' account(s).
Identity theft	It is a crime where the criminals impersonate individuals, usually for financial gain.
Intellectual property theft	Stealing practical or conceptual information developed by another person or company.
Salami slicing	Stealing tiny amounts of money from each transaction.
Scam	Tricking people into believing something that is not true.
Spam	Distribute unwanted e-mail to a large number of internet users.
Spoofing	It is a malicious practice in which communication is sent from unknown source disguised as a source known to the receiver.

OR

Explain the different types of inheritance

There are different types of inheritance viz.,

- Single inheritance
- Multiple inheritance
- Multilevel inheritance
- Hybrid inheritance
- Hierarchical inheritance

1. Single Inheritance

- When a derived class inherits only from one base class, it is known as single inheritance

2. Multiple Inheritance

- When a derived class inherits from multiple base classes it is known as multiple inheritance

3. Hierarchical inheritance

- When more than one derived classes are created from a single base class, it is known as Hierarchical inheritance.

4. Multilevel Inheritance

- The transitive nature of inheritance is itself reflected by this form of inheritance.
- When a class is derived from a class which is a derived class - then it is referred to as multilevel inheritance.

5. Hybrid inheritance

- When there is a combination of more than one type of inheritance, it is known as hybrid inheritance.
- Hence, it may be a combination of Multilevel and Multiple inheritance or Hierarchical and Multilevel inheritance or Hierarchical, Multilevel and Multiple inheritance.

Mrs. GEETHAMARIMUTHU, M.Sc., B.Ed.
P.G. Computer Science
VMG RR SRI SARADA SAKTHI MHSS
VIRUDHUNAGAR