

STD: XI

COMPUTER SCIENCE



VIRUDHUNAGAR DISTRICT

COMMON QUARTERLY EXAMINATION – SEPTEMBER 2023

STD: XI - A

COMPUTER SCIENCE

PART – I

I. ANSWER ALL THE QUESTIONS:

15 X 1 = 15

1. C. Power on self test

2. c. Peta

3. d. None of the above

4. d. c. 1

5. d. derived gate

6. c. 1

7. d. Pits

8. d. Cache memory

9. a. windows

10. b. $0 \leq i$

11. d. 3

12. Bjarne Stroustrup

13. a. >>

14. c. &

15. Empty statement

PART – II

II. Answer ANY SIX of the following and question no. 23 is compulsory;

16. Distinguish between data and information.

➤ Distinguish between Data and Information.

Data:	Information:
Data is defined as an unprocessed collection of raw facts, suitable for communication, interpretation or processing.	✓ Information is a collection of facts from which conclusions may be drawn.

17. Write the 1's complement procedure.

This is for negative numbers only i.e. the number whose MSB is 1

- Step 1: Convert given Decimal number into Binary
- Step 2: Check if the binary number contains 8 bits, if less add 0 at the left most bit, to make it as 8 bits.
- Step 3: Invert all bits (i.e. Change 1 as 0 and 0 as 1)

Example:

- Find 1's complement for $(-24)_{10}$

Given Number	Binary Number	1's Complement
$(-24)_{10}$	00011000	11100111

18. Write the associative laws?

$$A + (B + C) = (A + B) + C$$

$$A \cdot (B \cdot C) = (A \cdot B) \cdot C$$

19. What is the multi-user Operating system?

Multi-user Operating system:

- It is used in computers and laptops that allow same data and applications to be accessed by multiple users at the same time.
- The users can also communicate with each other. Windows, Linux and UNIX are examples for multi-user Operating System

20. What are called standard icons?

Standard icons:

- The icons which are available on desktop by default while installing Windows OS are called standard icons.
- The standard icons available in all Windows OS are My Computer, Documents and Recycle Bin.

21. Define a loop invariant.

- An invariant the loop body is known as a loop invariant.

STD: XI**COMPUTER SCIENCE**

-
- When the loop ends, the loop invariant has the same value.

22. What are keywords? Give example.

- Keywords are the reserved words which convey specific meaning to the C++ compiler.
- Keywords are Essential elements of C++ programs.

Example: for, while, if

23. output:

10 8 6 4 2

24. 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.

PART - III**II. Answer ANY SIX of the following and question no. 23 is compulsory;****25. What are the Characteristics of Computer?**

- Computer is the powerful machine.
- It can perform large number of tasks.
- The main capacities of computer are work length, speed accuracy, diligence, versatility memory and automation and lots of more tasks.

26. Convert $(148)_{10}$ int binary and then convert that binary number to Hexadecimal number.

$148/2$	=	74	0
$74/2$	=	37	0
$37/2$	=	18	1
$18/2$	=	9	0
$9/2$	=	4	1
$4/2$	=	2	0
$2/2$	=	1	0

010	010	100
└──┬──┘	└──┬──┘	└──┬──┘
2	2	4

$$(148)_{10} = (10010100)_2 = (224)_8$$

27. Add: $1101010_2 + 101101_2$ Subtract: $1101011_2 - 111010_2$

$$\begin{array}{r}
 1101010 \\
 + 101101 \\
 \hline
 10010111 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1101011 \\
 - 111010 \\
 \hline
 110001 \\
 \hline
 \end{array}$$

28. Classify the microprocessor based on the size of the data.

- 8-bit microprocessor
- 16-bit microprocessor
- 32-bit microprocessor
- 64-bit microprocessor

29. What are the functions of Windows Operating system.

Functions of Windows Operating System are:

- Access applications on the computer (word processing, games, spread sheets, calculators and so on).
- Load any new program on the computer.
- Manage hardware such as printers, scanners, mouse, digital cameras etc.,
- File management activities (For example creating, modifying, saving, deleting files and folders).

30. What is the format of the specification of an algorithm?

Let P be the required property of the inputs and Q the property of the desired outputs. Then the algorithm S is specified as

1. algorithm_name (inputs)
2. --inputs : P
3. --outputs: Q

31. What is the use of a header file?

- ☛ If you fail to include `iostream` in your program, an error message will occur on `cin` and `cout`; and we will not be able to get any input or send any output.
- ☛ `iostream` header file contains the definition of its member objects `cin` and `cout`.



32. Write a C++ program to print multiplication table of a given number.

```
#include<iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
int num; cout<<"Enter Number To Find Multiplication table "; cin>>num;
```

```
for(int a=1;a<=10;a++)
```

```
{
```

```
cout<<num<<" * "<<a<<" = "<<num*a<<endl;
```

```
}
```

```
return 0;
```

```
}
```

Output:

```
Enter Number To Find Its Multiplication table 3
3 * 1 = 3
3 * 2 = 6
3 * 3 = 9
3 * 4 = 12
3 * 5 = 15
3 * 6 = 18
3 * 7 = 21
3 * 8 = 24
3 * 9 = 27
3 * 10 = 30
Press any key to continue
```

33. Write the Rules for naming an identifier?

- The first character of an identifier must be an alphabet or an underscore (_).
- Only alphabets, digits and underscore are permitted. Other special characters are not allowed as part of an identifier.
- C++ is case sensitive as it treats upper and lower-case characters differently.
- Reserved words or keywords cannot be used as an identifier name.



PART - D

34. Explain the following:

- a. Keyboard b. Multimedia projector c. Booting

Keyboard:

- Keyboard (wired / wireless, virtual) is the most common input device used today. The individual keys for letters, numbers and special characters are collectively known as character keys.
- This keyboard layout is derived from the keyboard of original typewriter. The data and instructions are given as input to the computer by typing on the keyboard. Apart from alphabet and numeric keys, it also has Function keys for performing different functions.
- There are different set of keys available in the keyboard such as character keys, modifier keys, system and GUI keys, enter and editing keys, function keys, navigation keys, numeric keypad and lock-keys.

Multimedia Projectors:

Multimedia projectors are used to produce computer output on a big screen. These are used to display presentations in meeting halls or in classrooms.

Bootting:

- An Operating system (OS) is a basic software that makes the computer to work.
- When a computer is switched on, there is no information in its RAM.
- At the same time, in ROM, the pre-written program called POST (Power on Self Test) will be executed first.
- This program checks if the devices like RAM, keyboard, etc., are connected properly and ready to operate.
- If these devices are ready, then the BIOS (Basic Input Output System) gets executed. This process is called Bootting.

Bootting process is of two types.

- 1) Cold Booting
- 2) Warm Booting

Cold Booting: When the system starts from initial state i.e. it is switched on, we call it cold booting or Hard Booting.

Warm Booting: When the system restarts or when Reset button is pressed, we call it Warm Booting or Soft Booting.

STD: XI

COMPUTER SCIENCE



or

a) -98 b) -135

a) -98

$$\begin{array}{r}
 2 \overline{) 98} \\
 \underline{2 49} \\
 2 \underline{24} \\
 2 \underline{12} \\
 2 \underline{6} \\
 2 \underline{3} \\
 2 \underline{1}
 \end{array}$$

$$= 98_{10} = 1100010$$

8 bit format of 98_{10}

$$= 01100010$$

$$1's \text{ complement} = 10011101$$

$$\text{Add 1 bit} = + 1$$

$$2's \text{ complement} = \underline{\underline{10011110}}$$

b) -135

$$\begin{array}{r}
 2 \overline{) 135} \\
 \underline{2 67} \\
 2 \underline{33} \\
 2 \underline{16} \\
 2 \underline{8} \\
 2 \underline{4} \\
 2 \underline{2} \\
 2 \underline{1}
 \end{array}$$

$$135_{10} = 10000111$$

$$1's \text{ complement} = 01111000$$

$$\text{Add 1 bit} = + 1$$

$$2's \text{ complement} = \underline{\underline{01111001}}$$

35. Explain the derived gates with expression and truth table.



NAND, NOR, XOR and XNOR are derived gates which are derived from the fundamental gates.

1. NAND Gate:

The NAND gate operates an AND gate followed by a NOT gate. It acts in the manner of the logical operation "AND" followed by inversion. The output is "false" if both inputs are "true", otherwise, the output is "true".

The output of the NAND gate is

$$C = \overline{A \cdot B}$$

The logical sy



The truth table for NAND gate is

Input		Output
A	B	C
0	0	1
0	1	1
1	0	1
1	1	0

2. NOR Gate:

The NOR gate circuit is an OR gate followed by an inverter. Its output is "true" if both inputs are "false". Otherwise, the output is "false".



The output of NOR gate is

$$C = \overline{A + B}$$

Read this as "C equals NOT of A OR B" or "C equals the complement of A OR B".

Input		Output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	0

3. XOR Gate

The XOR (exclusive - OR) gate acts in the same way as the logical "either/or." The output is "true" if either, but not both, of the inputs are "true". The output is "false" if both inputs are "false" or if both inputs are "true".

In boolean algebra, exclusive - OR operator \oplus or "encircled plus".

Hence $C = A \oplus B$

The logical symbol of XOR gate is



Input		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

4. XNOR Gate

The XNOR (exclusive - NOR) gate is a combination XOR gate followed by an inverter.

The logical symbol is



The truth table for XNOR Gate is

Input		Output
A	B	C
0	0	1
0	1	0
1	0	0
1	1	1



or

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).

b) 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.



36. Explain the concept of a Distributed Operating System.

Distributed Operating System:





- **Distributed Operating System** feature takes care of the data and application that are stored and processed on multiple physical locations across the world over the digital network (internet/intranet).
- The Distributed Operating System is used to access shared data and files that reside in any machine around the world.
- The user can handle the data from different locations.
- The users can access as if it is available on their own computer.

The advantages of distributed Operating System are as follows:

- A user at one location can make use of all the resources available at another location over the network.
- Many computer resources can be added easily in the network □ Improves the interaction with the customers and clients.
- Reduces the load on the host computer.










Or

Explain the version of Windows Operating System.

Versions	Logo	Year	Specific features
Windows 1.x		1985	<ul style="list-style-type: none"> • Introduction of GUI in 16-bit processor • Mouse was introduced as an input device.
Windows 2.x		1987	<ul style="list-style-type: none"> • Supports to minimize or maximize windows. • Control panel feature was introduced with various system settings and customising options.
Windows 3.x		1992	<ul style="list-style-type: none"> • Introduced the concept of multitasking. • Supported 256 colours which brought a more modern, colourful look to the interface.
Windows 95		1995	<ul style="list-style-type: none"> • Introduced Start button, the taskbar, Windows Explorer and Start menu. • Introduced 32-bit processor and focused more on multitasking.

STD: XI

COMPUTER SCIENCE

Windows 98		1998	<ul style="list-style-type: none"> Integration of the Web browser (Internet Explorer) with the Operating System. DOS gaming began to disappear as Windows based games improved. Plug and play feature was introduced.
Windows NT			<ul style="list-style-type: none"> Designed to act as servers in network.
Windows Me		2000	<ul style="list-style-type: none"> It introduced automated system diagnostics and recovery tools.
Windows 2000		2000	<ul style="list-style-type: none"> Served as an Operating System for business desktop and laptop systems. Four versions of Windows 2000 were released: Professional (for business desktop and laptop systems), Server (both a Web server and an office server), Advanced Server (for line-of-business applications) and Data Centre Server (for high-traffic computer networks).
Windows XP		2001	<ul style="list-style-type: none"> Introduced 64-bit Processor. Improved Windows appearance with themes and offered a stable version.
Windows Vista		2006	<ul style="list-style-type: none"> Updated the look and feel of Windows.
Windows 7		2009	<ul style="list-style-type: none"> Booting time was improved, introduced new user interfaces like Aero Peek, pinning programs to taskbar, handwriting recognition etc. and Internet Explorer 8.
Windows 8		2012	<ul style="list-style-type: none"> Windows 8 is faster than previous versions of Windows. Start button was removed. Windows 8 takes better advantage of multi-core processing, solid state drives (SSD), touch screens and other alternate input methods. Served as common platform for mobile and computer.
Windows 10		2015	<ul style="list-style-type: none"> Start Button was added again. Multiple desktop. Central Notification Center for App notification and quick actions. Cortana voice activated personal assistant.



1. Explain the building blocks of an algorithm.

We construct algorithms using basic building blocks such as

- Data
- Variables
- Control flow
- Functions

1. Data

Algorithms take input data, process the data, and produce output data.

Computers provide instructions to perform operations on data.

For example, there are instructions for doing arithmetic operations on numbers, such as add, subtract, multiply and divide. There are different kinds of data such as numbers and text.

2. Variables

Variables are named boxes for storing data. When we do operations on data, we need to store the results in variables. The data stored in a variable is also known as the value of the variable. We can store a value in a variable or change the value of variable, using an assignment statement.

3. Control flow

An algorithm is a sequence of statements. However, after executing a statement, the next statement executed need not be the next statement in the algorithm. The statement to be executed next may depend on the state of the process.

4. Functions

The parts of an algorithm are known as functions. A function is like a sub algorithm. It takes an input, and produces an output, satisfying a desired input output relation.



or

Write about Binary operators used in C++.

Binary Operators - Require two operands C++

Operators are classified as:

- (1) Arithmetic Operators
- (2) Relational Operators
- (3) Logical Operators
- (4) Bitwise Operators
- (5) Assignment Operators
- (6) Conditional Operator

(1) Arithmetic Operators

Arithmetic operators to perform simple arithmetic operations like addition, subtraction, multiplication, division etc.,

Operator	Operation	Example
+	Addition	$10 + 5 = 15$
-	Subtraction	$10 - 5 = 5$
*	Multiplication	$10 * 5 = 50$
/	Division	$10 / 5 = 2$ (Quotient of the division)
%	Modulus (To find the remainder of a division)	$10 \% 3 = 1$ (Remainder of the division)

(2) Relational Operators

Relational operators are used to determine the relationship between its operands. When the relational operators are applied on two operands, the result will be a Boolean value i.e 1 or 0 to represents **True** or **False** respectively. C++ provides six relational operators. They are,

Operator	Operation	Example
>	Greater than	$a > b$
<	Less than	$a < b$
>=	Greater than or equal to	$a >= b$
<=	Less than or equal to	$a <= b$
==	Equal to	$a == b$
!=	Not equal	$a != b$

(3) Logical Operators

STD: XI**COMPUTER SCIENCE**

➤ A logical operator is used to evaluate logical and relational expressions. The logical operators act upon the operands that are themselves called as logical expressions.

C++ provides three logical operators.

Operator	Operation	Description
&&	AND	The logical AND combines two different relational expressions in to one. It returns 1 (True), if both expression are true, otherwise it returns 0 (false).
	OR	The logical OR combines two different relational expressions in to one. It returns 1 (True), if either one of the expression is true. It returns 0 (false), if both the expressions are false.
!	NOT	NOT works on a single expression / operand. It simply negates or inverts the truth value. i.e., if an operand / expression is 1 (true) then this operator returns 0 (false) and vice versa

Expression	Result
(a<b) && (b<c)	1 (True)
(a>b) && (b<c)	0 (False)
(a<b) (b>c)	1 (True)
!(a>b)	1 (True)

Example: a = 5, b = 6, c = 7;

(4)Bitwise Operators

Bitwise operators work on each bit of data and perform bit-by-bit operation.

In C++, there are three kinds of bitwise operators, which are:

- (i) Logical bitwise operators
- (ii) Bitwise shift operators
- (iii) One's complement operators

(5)Assignment Operator:

Assignment operator is used to assign a value to a variable which is on the left hand side of an assignment statement.

= (equal) is commonly used as the assignment operator in all computer programming languages.

This operator copies the value at the right side of the operator to the left side variable. It is also a binary operator.



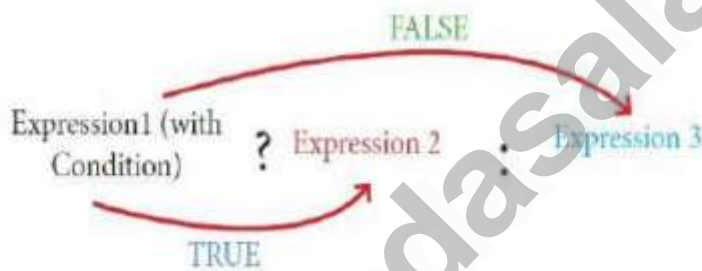
Operator	Name of Operator
+=	Addition Assignment
-=	Subtraction Assignment
*=	Multiplication Assignment
/=	Division Assignment
%=	Modulus Assignment

(6) Conditional Operator:

- In C++, there is only one conditional operator is used. ?: is a conditional Operator.
- This is a Ternary Operator.
- This operator is used as an alternate to if ... else control statement.

The syntax of the conditional operator is:

```
expression 1 ? expression 2 : expression 3
```



38. What entry control loop? Explain any one of the entry control loop with suitable example. Entry control loop:

Loop body will be executed if the condition is true otherwise the loop will not be executed.

Examples of Entry Controlled Loop:

- for loop
- while loop

for loop:

The for-loop is the easiest looping statement which allows code to be executed repeatedly.

STD: XI

COMPUTER SCIENCE

**The general syntax is: Flow chart:**

for (initialization(s); test-expression; update expression(s))

{

Statement 1; Statement 2;

}

Statement-x;

Example Program:

```
#include <iostream> using namespace std;
int main ()
{ int i;
for(i = 0; i < 5; i ++ )
cout<< "value of i : " <<i<<endl;
return 0;
}
```

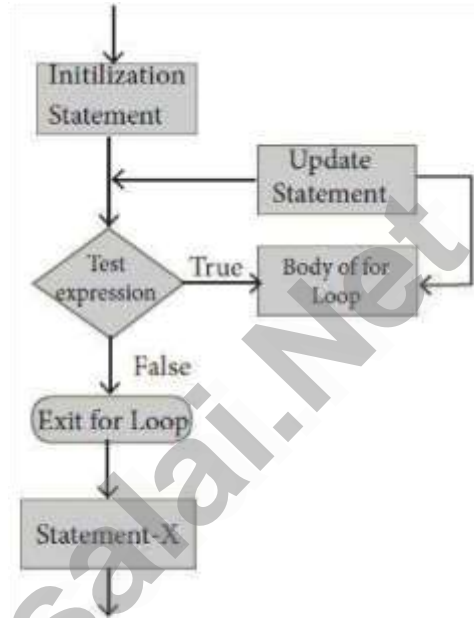
Output

```
value of i : 0
value of i : 1
value of i : 2
value of i : 3
value of i : 4
```

or

Write a program to find sum of the series

```
#include <iostream>
using namespace std; int main()
{ clrscr();
long i,n,x,sum=1;
cout<<"1+x+x^2+.....+x^n"; cout<<"\n
Enter the value of x and n:";
cin>>x>>n; for(i=1;i<=n;++i)
sum+=pow(x,i); cout<<"\n
sum="<<sum;
```



STD: XI

COMPUTER SCIENCE

```
➤  
getch();  
}
```

Output:

```
1+x+x^2+.....+x^n  
Enter the value of x and n:5  
2  
Sum=31
```

Mrs. GEETHAMARIMUTHU

PG. ASST. COMPUTER SCIENCE

V.M.G.RAJASEKARAN – RAMANI SIR SARADA SAKTHI MHSS

VIRUDHUNAGAR

626001