

## COMMON HALF YEARLY EXAMINATION DECEMBER 2018

STD : XI  
TIME : 2.30 Hrs

SUBJECT: COMPUTER SCIENCE  
TOTAL MARKS: 70

### KEY ANSWER

#### PART-A

15X1=15

1. C) Fifth
2. B) C
3. B) Both
4. C) iii
5. A) Mark shuttle worth
6. C) 3
7. B) m=7, n=-8
8. C) C++ has not a function library
9. C) goto
10. A) base-exponent
11. A) Structure variable
12. B) (i) and (ii) only
13. C) void fun(double d); void fun(char ch)
14. D) class student : public school
15. B) Intellectual property theft

#### PART-B

6X2=12

16. Add :  $-22_{10} + 15_{10}$

Subtract :  $1101011_2 - 111010_2$

Handwritten work for question 16:

$$\begin{array}{r} 2 \ 22 \\ 2 \ 11 \\ 2 \ 5 \\ 2 \ 2 \\ \hline 1 \ 0 \end{array} \begin{array}{r} - 0 \\ - 1 \\ - 1 \\ - 1 \\ - 0 \end{array}$$

$$\begin{array}{r} 2 \ 15 \\ 2 \ 7 \\ 2 \ 3 \\ 1 \ 1 \\ \hline (1111)_2 \end{array}$$

$$\Rightarrow (10110)_2 \Rightarrow (00001111)_2$$

$$\Rightarrow 00010110$$

$$2^{\text{nd}} \text{ complement} \Rightarrow 11101001$$

$$2^{\text{nd}} \text{ complement} \Rightarrow 11101010$$

$$(-22)_{10} + (15)_{10} \Rightarrow \begin{array}{r} 11101010 \\ 00011111 \\ \hline 11110001 \end{array}$$

$$(-22)_{10} + (15)_{10} = \boxed{11110001}$$

Handwritten work for question 16 (subtraction):

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

#### 17. Security management Features in Os.

- (1) File access level
- (2) System level
- (3) Network level

#### 18. Logoff from Ubuntu OS:

When you have finished working on your computer, you can choose to Log Out, Suspend or Shut down through the Session Indicator on the far right side of the top panel.

#### 19. Abstraction:

A problem can involve a lot of details. Several of these details are unnecessary for solving the problem. Only a few details are essential.

Abstraction is the process of *hiding or ignoring* the details irrelevant to the task so as to model a problem only by its essential features.

#### 20. While loop: 3,6,9,12.....30

```
While(i=3<31)
{
cout<< i;
i=i+3;
}
```

#### 21. Syntax of 2-D Array:

Two-dimensional (2D) arrays are collection of similar elements where the elements are stored in certain number of rows and columns.

An example  $m \times n$  matrix where  $m$  denotes the number of rows and  $n$  denotes the number of columns.

#### Example:

```
int arr[3][3];
```

#### 22. Disadvantage of OOP:

- > Size
- > Effort
- > Speed

#### 23. Difference b/w Public and Private:

**Public:** Members under specifier can accessed from Outside.  
**Private:** Members under specifier cant accessed from Outside.

#### 24. Digital signature:

Digital signatures are based on asymmetric cryptography and can provide assurances of evidence to origin, identity and status of an electronic document, transaction or message, as well as acknowledging informed by the signer.

## PART-C

6X3=18

## 25. Differentiate optical and Laser Mouse.

Optical Mouse	Laser Mouse
Measures the motion and acceleration of Pointer.	Measures the motion and acceleration of pointer.
It uses light source instead of ball to judge the motion of the pointer.	Laser Mouse uses Laser Light.
Optical mouse has three buttons.	Laser mouse has three buttons
Optical mouse is less sensitive towards surface.	Laser Mouse is highly sensitive and able to work on any hard surface.

## 26. Mobile OS:

A Mobile operating system controls a mobile device and its design supports wireless communication and different types of mobile applications.

- i. Google Android
- ii. Apple iOS
- iii. Blackberry
- iv. Symbian

## 27. Procedure to Rename a file.

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

## Procedure to save a file

Type the contents in the workspace and save the file using **File → Save or Ctrl + S**.

## 28. Case Analysis:

- Alternative statement analyses the problem into two cases. Case analysis statement generalizes it to multiple cases.
- Case analysis splits the problem into an exhaustive set of disjoint cases. For each case, the problem is solved independently.

## 29.

Logical error	Syntax error
A Program has not produced expected result even though the program is grammatically correct.	Syntax is a set of grammatical rules to construct a program.
Program is grammatically correct, but it contains some logical error.	Syntax errors occur when grammatical rules of C++ are violated.
Semantic error is also called as “ <b>Logic Error</b> ”.	<b>EX:</b> cout << “Welcome to Programming in C++” Error: End of the above statement ; is missing.

## 30. Explain:

- strcat() - This function takes two arguments. (To join two strings)
- strupr() - To convert the given string into Uppercase letters.
- strlwr() - To convert the given string into Lowercase letters.

## 31. Modularization:

- Modularisation:** Where the program can be decomposed into **modules**.
- Software re-use:** Where a program can be composed from existing and new modules.

## 32. Characteristics of constructors:

- The name of the constructor must be same as that of the class
- No return type can be specified for constructor
- A constructor can have parameter list
- The constructor function can be overloaded
- They cannot be inherited but a derived class can call the base class constructor
- The compiler generates a constructor, in the absence of a user define

## 33. Function Overloading:

- The ability of the function to process the message or data in more than one form is called as function overloading.
- Function overloading means two or more functions in the same scope share the same name but their parameters are different. In this situation, the functions that share the same name are said to be overloaded and the process is called function overloading.

## PART-D

5X5=25

## 34. Characteristics of 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.

**Windows and Ubuntu icons.**

(or)



S.No	Windows	Ubuntu
1	Recycle Bin	Trash
2	My computer	Files
3	Ms word	Libreoffice writer

**35. Given two glasses marked X and Y. Glass X is full of apple drink and glass Y is full of grape drink. For exchanging the contents of glasses X and Y, represent the state by suitable variables, and write the specification of the algorithm.**

Solution:

Exchange (X, Y)

--Inputs: X, Y are integers, X≠0, Y≠0

--Outputs: X, Y are Integers,

t:=X  
X:=Y  
Y:=t

(or)

**Recursive problem solving:**

Each solver should test the size of the input. If the size is small enough, the solver should output the solution to the problem directly. If the size is not small enough, the solver should reduce the size of the input and call a sub-solver to solve the problem with the reduced input.

**Factorial of a natural number recursively.**

“The **factorial** of a **number** is the product of all the integers from 1 to that **number**.”

*For example*, the **factorial** of 4 (denoted as 4!) is 1\*2\*3\*4= 24.

Factorial (4)  
i = 1, f = 1;  
= f = 1 x 1 = 1  
= f = 1 x 2 = 2  
= f = 2 x 3 = 6  
= f = 6 x 4 = 24

**36. Use of Binary operators:**

**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

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)

**(1) Arithmetic Operators**

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

**(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.

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**

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.

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

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

Operator	Operation
&&	AND
	OR
!	NOT

#### (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.

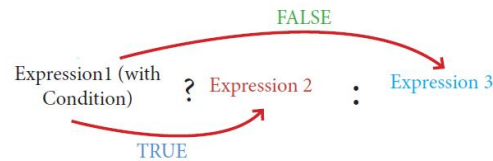
Operator	Name of Operator
+=	Addition Assignment
-=	Subtraction Assignment
*=	Multiplication Assignment
/=	Division Assignment
%=	Modulus Assignment

#### (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



(or)

#### Control Statement:

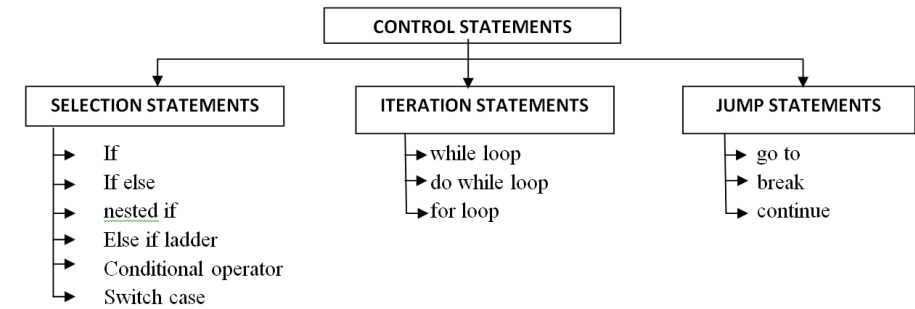
- Control statements are statements that alter the sequence of flow of instructions.

In a program, statements may be executed sequentially, selectively or iteratively. Every programming languages provides statements to support sequence, selection (branching) and iteration.

If the Statements are executed sequentially, the flow is called as sequential flow.

In some situations, 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 (;).



1) **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**.

2) **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.

3) **Jump Statement** are used

- (1) *goto*
- (2) *break*
- (3) *continue*

#### 37. Call by value

Call by value method copies the value of an actual parameter into the formal parameter of the function. In this case, changes made to formal parameter within the function will have no effect on the actual parameter.

#### Example Program:

```
#include<iostream>
using namespace std;
void display(int x)
{
    int a=x*x;
    cout<<"\n\n The Value inside display function (a * a):"<<a;
}
int main()
{
    int a;
    cout<<"\n\n Enter the Value for A :";
    cin>>a;
    display(a);
    cout<<"\n\n The Value inside main function "<<a;
    return(0);
}
```

#### Output :

```
Enter the Value for A : 5
The Value inside display function (a * a) : 25
The Value inside main function 5
```

(or)

**Types of Inheritance:**

There are different types of inheritance viz., Single Inheritance, Multiple inheritance, Multilevel inheritance, hybrid inheritance and 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.

**38. Debug Program:****Output**

-----  
15  
14  
13

Program :  
-----

```
#include<iostream>
#include<conio.h>
class A
{
public:
int a1,a2,a3;
void getdata()
{
a1=15;
a2=14;
a3=13;
}
};
class B:: public A
{
```

```
public:
void func()
{
int b1,b2,b3;
A::getdata();
b1=a1;
b2=a2;
b3=a3;
cout<<b1<< '\t'<<b2<< '\t'<<b3;
}
};
int main()
{
clrscr()
B der;
der.func();
getch();
return 0;
}
```

(or)

**Output:**

Enter values for a and b (sample data 6 and 7).... 6 7  
The two integers are.... 6 7  
The sum of the variables 6 + 7 = 13

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