COMPUTER SCIENCE SYLLABUS

STD XII

ACADEMIC YEAR-2022-2023

FIRST TERM (MARKS:- 40)		
UNIT NO	**NAME OF UNIT**	**MAX MARKS**
1	PROGRAMMING IN C++	25
4	BOOLEAN ALGEBRA	10
5	NETWORK (PART-I)	05
	TOTAL	**40**
SECOND TERM (MARKS:- 30)		
2.	DATA STRUCTURE IN C++	15
3.	FILE HANDLING IN C++	10
5.	NETWORK (PART-II)	05
	TOTAL	**30**

UNIT-I:

PROGRAMMING IN C++ (25 MARKS)

1. C++ Fundamentals:

- C++ character set
- Identifiers and Keywords
- Data Types: int, float, char, double, void
- Qualifiers: short, long, signed, unsigned, const
- Constants (Integer, Floating point, character, string, enumeration constants, symbolic constants
- Escape Sequence (\b, \t, \n, \v, \a, \f,\r, \0)
- Variables and Declaration, Dynamic initialization of variables, reference Variables

2. Operators and Expressions:

- Unary Operators: unary minus,++, - -, !, sizeof(),typecast
- Arithmetic Operators: *, /, %,+,-
- Relational Operators: <, <=, >, >=
- Equality Operators: ==, !=
- Logical Operators: &&, ||
- Conditional Operator: ?:
- Assignment Operator: =, +=, -=, *=, /=, %=
- Scope resolution operators(::)
- Memory management operators: new(), delete()
- Operator precedence and associativity

3. Data Input and Output

- Header file <iostream.h>
- Using cin and cout with Insertion and extraction operators
- Manipulators: Definition, Header file <iomanip.h>
  setw, endl, setprecision, setfill, setiosflags, resetiosflags
  Flags : ios::left, ios::right, ios::scientific, ios::fixed,
  ios::showpos, ios::showpoint, ios::skipus, ios::unitbuf.

4. Use of editor, basic commands of editor, Compilation, Linking and Execution of Program, Debugging.

5. Control Statements:

If-else statement, while statement, do-while statement, for statement, switch statement. break statement, continue statement Comma operator.

6. Functions:

Definition, Concept, General Form, Function Declaration, Function Definition,Scope of a variable, Local and Global variables

Function Call (pass by value, pass by reference using pointers and pass by reference using reference variable) Calling Function with arrays as parameters, Return by Reference, Inline Functions,

Functions with Default Parameters, Function overloading

Built-in Functions:

<string.h>: strlen(), strcmp(), strcat(), strcpy()
<math.h> : log(), log10(), pow(), sqrt(), sin(), cos(), abs()
<ctype.h>: isalnum(), isdigit(), islower(), isupper(), tolower(), toupper(), isalpha(),isspace()
<stdio.h>: gets(),puts(),getchar(),putchar()
<conio.h>: clrscr(),getch()

7. Basic concepts of Object Oriented Programming:

Definition, Objects, Classes, Data Abstraction, Data Encapsulation, Inheritance, Polymorphism Characteristics of Object Oriented Programming

8. Classes and Objects:

Definition of class and object, Declaration of class, Defining member functions (inside the class and outside the class), Creating Objects, Accessing Class Members, Array of objects, Objects as function argument, Functions returning objects.

9. Constructors and Destructors

Definition and characteristics of constructors, Default Constructor, Constructor with Default Arguments, Parameterized constructors (explicit call, implicit call), Constructer overloading, Copy Constructor, Dynamic Constructor, Dynamic Initialization of objects, Destructor Definition and characteristics.

10. Inheritance:

Definition, Concept of Inheritance: Base , and derived classes,
Abstract classes Type of Inheritance: single, multiple, multilevel, hierarchical and hybrid. Defining Derived Class: Visibility modes (public, private, protected) Public Derivation, Private Derivation, Protected Derivation, Constructors in Derived classes, Containership Virtual base classes.

UNIT II :

DATA STRUCTURES USING C++ (15 MARKS)

1) Arrays:-

- One Dimensional arrays Definition, Declaration, Reading, Displaying, Accessing. Algorithm and Program for inserting and deleting an element in an array. Memory allocation. Sorting: Definition, sorting techniques (Insertion Sort, Selection Sort, Bubble Sort algorithms and programs) Searching: Definition, Searching Techniques (Linear Search, Binary Search Algorithms and Programs) Merging: Definition, Algorithm and Program to merge two sorted arrays Applications: Insertion of an element in a sorted array, Displaying common elements of two single dimensional arrays and other applications. •
- Two Dimensional Arrays Definition, Declaration, Reading, Displaying, Accessing. Applications: Matrix Addition, Transpose of a matrix, Matrix Multiplication, Representation of sparse matrix in 3- Tuple form, and other applications.

2) Structures and Pointers:

- Pointers- Definition, Concept, Declaration, Pointer to one and two dimensional array.

- Structures- Definition, Concept, Declaration, Structure variable, array of structures, pointer to a structure variable, pointer to array of structures.

3) **Linked lists**

- Singly Linked list: Concept, Definition, Diagram, Operations (Creation, Display, Deletion of a node at any position, Insertion of a node at any position).
- Circular Linked list: Concept, Definition, Diagram.
- Doubly Linked List: Concept, Definition, Diagram
- Applications of singly linked list- Linear search and other applications.
- Stacks: Concept, Definition, and implementation of a stack using linked list(PUSH,POP and display). Applications of stacks (Infix, Postfix and Prefix Notations of expressions, Conversion of infix to postfix using stacks [Algorithms and problems only], Evaluation of postfix expressions[Algorithms and problems only]).
- Queues: Linear queue- Concept, Definition, Implementation of queue using linked list(Add, Delete and Display). Circular Queue- Concept, Definition.

UNIT III:

FILE HANDELING (10 MARKS)

- Files: Definition, Types of files-Text and Binary.
- Stream Classes and their Member Functions. Ifstream- get(), getline(), read(), seekg(),tellg(), Open(),close(),eof() Ofstream- put(), seekp(), tellp(), write(), Open(),close(). Fstream.
- File Modes-ios:: app, ios::ate, ios::in, ios::out, ios::binary, ios::trunc, ios::nocreate, ios::noreplace
- Opening a file using constructor and using open member function.
- Closing a file.
- Detecting the end of a file.
- File Pointer and their manipulation.
- Text Files: Creation, Display and File Processing (Character and String based processing)
- Binary Files: Creation, Display and File Processing (Appending, Inserting, Deleting, Updating, Searching, Splitting and Merging)

UNIT IV:

BOOLEAN ALGEBRA (10 marks)

- Basics of Boolean Algebra :- Evolution of Boolean Algebra , Basic Terminology – Logical Statements, Logical Constants, Binary Valued Quantities , Compound Statements, Truth Table.
- Logical operators:- NOT, AND, OR , Switch, Switching Circuits (NOT, AND, OR).
- Postulates of Boolean algebra:- Closure Property, Commutative Property , Associative Property Distributive Property , Identity Property , Inverse Property .
- Laws of Boolean Algebra : Idempotent Law, Distributive Law, Absorption Law, Involution law.
- DeMorgan's Law and their applications.

- Principle of Duality in Boolean algebra.
- Derivation of Boolean expression:
- Minterm , Maxterm , Shorthand Notation, Canonical Form, Sum of Product form (SOP), Product of Sum form (POS), Conversion of SOP to POS and vice versa, simplification of boolean expressions using postulates and laws of Boolean Algebra.
- Karnaugh Maps: Two variable K map, Three variable K map, Four variable K map, Pairing , Quads, Octet in K map, Simplification of K maps up to four variables , Overlapping groups , map rolling, eliminating redundant groups, use of K map for simplification and conversion of Boolean expression.
- Logic gates: Fundamental gates: AND gate, OR gate, NOT gate (Definition, Symbol, Truth table)
- Derived gates: NOR gate, NAND gate, X-OR gate, X-NOR gate (Definition, Symbol, Truth Table), NAND and NOR gates as universal gates. Constructing logic circuits using basic gates and universal gates.
- Adder circuits: Half Adder and Full Adder – Definition, Truth table, obtaining simplified expression for sum and carry ,Circuit Diagrams, obtaining full adder from half adders.

UNIT V-(10 MARKS)

COMPUTER NETWORKS -PART-I(MARKS:-05)

- **Networks:**
  Definition, Components, Need for Networking, advantages, disadvantages.

- **Types of Networks:**
  LAN, MAN, WAN (defination)

- **Network Devices and their uses:**
  Modem, Hub, Repeaters, Bridge, Router, Gateway, Switch.

- **Network Topologies:**
  Definition, Types of Topologies with advantages and disadvantages (Bus, Tree, Star, Ring).

- **Application of Networks:**
  Email, E-commerce, Chat Services, Video Conferencing, Usenet.

- **Internet Related Terminologies:**
  Internet, Internet Service Providers, Internet Addressing, World Wide Web(WWW), Uniform Resource Locator(URL), Web Server, Web page, Website, Web Browser, Hyper Text Mark-up Language (HTML), Dynamic Hyper Text

Mark-up Language (DHTML), Search Engine, Downloading and Uploading files, Hacking, Cracking,

COMPUTER NETWORKS -PART-II(MARKS:-05)

- **Communication Channel:**
  Physical Channel: Twisted Pair Cable, Co-axial Cable, Optical Fibre Cable (Diagram, description, application).
  Wireless Channel: Microwave, Radio wave, and Satellite Links.
- **Data Switching Techniques:**
  Circuit Switching, Message Switching and Packet Switching.
- **Protocols:**
  Definition, File Transfer Protocol (FTP), Hyper Text Transfer Protocol (HTTP), Transmission Control Protocol/Internet Protocol(TCP/IP), Remote Login(Telnet).

SUGGESTED ASSIGNMENTS (any one)

1. Programs in C++ (Minimum 2), involving concepts related to Classes & Objects, Function Overloading, Inheritance, Constructors and Destructors.
2. Problem solving in Stack, Queues, Arrays and Linked list. For Example-Evaluation of postfix expression Conversion from infix to postfix expression Problems on Stacks and Queues etc.
3. Programs on basic file operations (Read,Write,Update, Search, Append etc)
4. Problems based on: K-MAPS Implementation of NAND –NOR & NOR-NAND logic Designing circuits using universal gates.
5. Presentations can be prepared on any topic related to computer networks.

N.B. Viva can be conducted on any of the related topics The criteria for the evaluation of the assignments should be based on the following. (As applicable for the appropriate assignments).

1. Understanding of concepts
2. Knowledge w.r.t. the assignment given
3. Content (for presentations)
4. Logic (for programs)
5. Test Cases- Programs should be tested for different set of inputs.

	SHORT PROGRAM LIST
1.	Write a C++ program to reverse a given positive integer M, of arbitrary length (i.e. any number of digits) and output M as well as its reverse.
2.	Write a C++ program to calculate Sin(x), by summing the terms of the sine series given below. N is the number of terms to be summed and x is real number specifying an angle in radians. Also check the result of your calculation with that of the standard library function sin(). Sin(x)= $x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!}$……up to N terms.
3.	Write a C++ program to generate the first N terms(N>=1) of the **Fibonacci series** 0, 1, 1, 2, 3, 5….....
4.	Write a C++ program to **count the no of vowels** in a given line of text. Output the line of text and the number of vowels in it.
5.	Define a class NUMBER_LIST having the following specifications: Private data member: num_list-an array of integers capable of storing maximum 10 numbers. Public member functions: read_list()- to read N(N<=10) numbers in the array num_list. calc_product()-to compute the product of the numbers in the array and display the numbers and their product.
6.	Write a C++ program to create an array of maximum size 10 and storing integer values. Input N (N<=10) numbers into the array. Process the array to find and output the **largest and the smallest** numbers from the array as well as all the values in the array.
7.	Write a C++ program to **transpose** a m x n matrix of integers , where (m!=n) and output the original input matrix and its transpose.
8.	Define a class with two private data members **d1** and **d2** of type **double** and one private member function **smaller(),** that returns the smaller of the two values. Define two public member functions as follows: get-data(double,double)- to assign values to the data members. put_data() - to display the data values and the **smaller of the two values** by calling **smaller().**
9.	Define a class **BASE** having one private data member num1 and one public data member num2 both of type float. Define public member functions : **input_data()**- to read data value **num1. get_num1()-** to return the value of **num1** Extend class **BASE** to another class **DERIVED** using public derivation. Define for class

	DERIVED, a private data member sum which is to be calculated by adding **num1** and **num2** and a public member function : **get_data()-** to read **num2** and to call **input_data()** for reading value to and to compute sum. **show_data()-** to output **num1 ,num2** and **sum.** Write a **main()** to create object of type **DERIVED** and input and output all data.
10.	Write a C++ program to create two text files named: **COUNTRY** and **CAPITAL** to store names of n countries and their corresponding capitals. Then read the files to display the names of their countries and their capitals in a neat tabular form.

LONG PROGRAM LIST

1.	Write a menu driven program in C++ to create an array of N integers sorted in ascending order and to search for a given value in the array using **Binary Search** algorithm.
2.	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Bubble Sort** technique. Output the array before and after sorting.
3.	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Selection Sort** technique. Output the array before and after sorting
4.	Write a menu driven program in C++ to create an array of N numbers and to sort the array in ascending order using **Insertion Sort** technique. Output the array before and after sorting.
5.	Write a C++ program to input two arrays A and B of integers , both sorted in ascending order .M**erge** A and B to obtain a third array C, such that C is also in ascending order. Output all the arrays A , B and C
6.	Write a C++ program to input two matrices having integer elements – M1 of order (m x n)and M2 of order (n x p) and obtain the **product matrix** P. Output all the three matrices M1, M2 and P.
7.	Write a menu driven program in C++ to create and display a linked list having N nodes, where the data part consist of empcode- integer empname- of

	maximum length 20 characters basic_pay- float allowance- float The output should be in a neat tabular form as shown below: ********** Sr.No Emp Code Emp Name Basic Pay Allowance Total 1 101 ..... **********
8.	Write a menu driven program in C++ to push and pop a value in a linked stack storing float point numbers. Display the contents of the **stack** after each operation.
9.	Write a menu driven program in C++ to add and remove a value in a linked queue storing float point numbers. Display the contents of the **queue** after each operation.
10	Define a class **STUDENT** having the following specifications: Private data members: **rollno**- integer **name** -of maximum length 35characters **marks**-an array of size 6 storing marks in 6 subjects Public member functions: **input()-**to read the data values **show()-** to compute the overall percentage of each student and to display all data Values. Write a C++ program to create and display a binary file having objects of type **STUDENT.**

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MODEL PAPER

FIRST TERMINAL EXAMINATION

STD XII SCIENCE **MARKS: 40**

SUBJECT: COMPUTER SCIENCE **TIME DURATION: 90 MIN**

Instructions:

1. Every question has four choices for its answer A), B), C) and D) . Only one ofthem is the correct answer.
2. On the OMR sheet, for each question number, darken with a ball point penONLY ONE bubble corresponding to what you consider to be the most appropriate answer, from among the four choices.
3. **Please note that it is not possible to change the answer once you havefilled up the bubble with a ball point pen. Hence sufficient care must betaken while darkening the bubbles.**
4. For each question, you will be awarded ONE mark if you have darkened onlythe bubble corresponding to the correct answer. In all other cases, you will get zero mark. **There is no negative mark.**
5. Only **one** OMR sheet will be provided.
6. Use only Black or Blue Ball Point Pen

Q.1) What is a difference between a declaration and a definition of a variable?

A) Both can occur multiple times, but a declaration must occur first.

B) A definition occurs once, but a declaration may occur many times.

C) A declaration occurs once, but a definition may occur many times.

D) Both can occur multiple times, but a definition must occur first.

Q.2) Code:

```
int z, x=5,y=-
10,a=4,b=2;
z = x++ - --y * b / a;
```

What number will z in the sample code above

contain?

A) 5 B) 6 C) 10 D) 12

Q.3) Sample Code:

```
int x = 3;
if( x ==
2 );
x = 0;
if( x ==
 3 )x++;
else x += 2;
```

What value will x contain when the sample code above is

executed?

A) 1 B) 2 C) 3 D) 4

Q.4) Sample Code:

```
int x = 0;
for (x=1; x<4; x++);
cout<<x<<endl;
```

What will be printed when the sample code above is

executed?

A) 1 B) 3 C) 4 D) 5

Q.5) Sample Code:

```
int x =
5;int y
= 2;
```

```
char op =
'*';switch
(op)
{
 case '+' : x +=
 y;case '-' : x -=
 y; default : x
 += 1;
}
```

After the sample code above has been executed, what value will the variable x

contain?

A) 4 B) 5 C) 6 D) 7

Q.6) Which of the following is false?

A) Cout represents the standard output stream in c++.
B) Cout is declared in the iostream standard file
C) Cout is declared within the std namespace
D) None of the above

Q.7) What does polymorphism in OOPs mean?

A) Concept of allowing overiding of functions
B) Concept of hiding data
C) Concept of keeping things in differnt modules/files
D) Concept of wrapping things into a single unit

Q.8) Statement I : All the non-private members of the base class can be accessed from the derived class as if they were members of the derived class.

Statement II : The protected data members can be accessed in the same classor in its derived class

A) Both are true.
B) Both are false
C) Statement I is true, statement II is false
D) Statement I is false, statement II is true.

Q.9) A derived class

A) Inherits data members and member functions from base class.
B) Inherits constructors and destructor.
C) Object can access protected members with the dot operator.
D) Inherits data members and member functions from base class as well asInherits constructors and destructor.

Q.10) The ability to reuse objects already defined, perhaps for a different purpose,with modification appropriate to the new purpose, is referred to as:

A) Information hiding.
B) Inheritance.
C) Redefinition.
D) Overloading

Q.11) _____is the good example of a method that is shared by all instance of aclass.

A) Constructor
B) Attribute
C) Constructor and Attribute
D) None of these options

Q.12) The design of classes in a way that hides the details of implementation fromthe user is known as:

A) Encapsulation
B) Information Hiding
C) Data abstraction
D) All of these options

Q.13) Which are the main three features of OOP language?

A) Data Encapsulation, Inheritance & Exception handling
B) Inheritance, Polymorphism & Exception handling
C) Data Encapsulation, Inheritance & Polymorphism
D) Overloading, Inheritance & Polymorphism

Q.14) What is a Constructor?

A) A function called when an instance of a class is initialized.
B) A function that is called when an instance of a class is deleted.
C) A special function to change the value of dynamically allocated memory.
D) A function that is called in order to change the value of a variable.

Q 15) Overloaded functions are

A) Very long functions that can hardly run
B) One function containing another one or more functions inside it.
C) Two or more functions with the same name but different number ofparameters or type.
D) None of above

Q 16) In case of pass by reference

A) The values of those variables are passed to the function so that it canmanipulate them
B) The location of variable in memory is passed to the function so that it canuse the same memory area for its processing
C) The function declaration should contain ampersand (&) in its typedeclaration
D) All of above

Q 17) How structures and classes in C++ differ?

A) In Structures, members are public by default whereas, in Classes, they areprivate by default
B) In Structures, members are private by default whereas, in Classes, they arepublic by default
C) Structures by default hide every member whereas classes do not
D) Structures cannot have private members whereas classes can have

Q 18) Which concept allows you to reuse the written code?

A) Encapsulation
B) Abstraction
C) Inheritance
D) Polymorphism

Q 19) What does modularity mean?

A) Hiding part of program
B) Subdividing program into small independent parts
C) Overriding parts of program
D) Wrapping things into single unit

Q 20) Why references are different from pointers?

A) A reference cannot be made null

B) A reference cannot be changed once initialized
C) No extra operator is needed for dereferencing of a reference
D) All of the mentioned

Q 21) Which of the following is not a type of inheritance?
A) Multiple
B) Multilevel
C) Distributive
D) Hierarchical

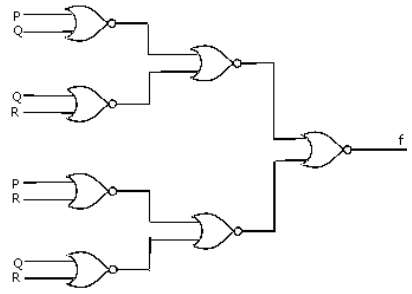
Q 22) Which of the following is correct in C++?
A) Classes cannot have protected data members
B) Structures can have member functions
C) Class members are public by default
D) Structure members are private by default

Q 23) Objects can be used _____
A) To access any member of a class
B) To access only public members of a class
C) To access only protected members of a class
D) To access only private members of a class

Q 24) In which access should a constructor be defined, so that object of the classcan be created in any function?
A) Public
B) Protected
C) Private
D)) Any access specifier will work

Q 25) If class C inherits class B. And B has inherited class A. Then while creating theobject of class C, what will be the sequence of constructors getting called?
A) Constructor of C then B, finally of A
B) Constructor of A then C, finally of B
C) Constructor of C then A, finally B
D) Constructor of A then B, finally C

Q.26) What is the Boolean expression for the output f of the combinational logic circuit of the NOR gates given below?



A) (Q+R)' B) (P+Q)' C) (P+R) D)(P+Q+R)'

Q.27) For the SOP expression $A\bar{B}C + \bar{A}BC + AB\bar{C}$, how many 1s are in the truth table's output column?

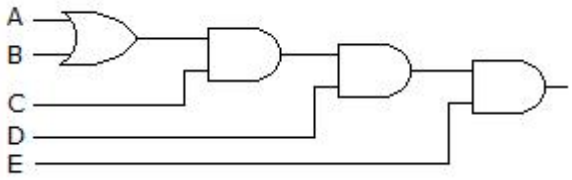
A.1
B.2
C.3
D.5

Q.28) From the truth table below, determine the standard SOP Expression

Inputs			Output
A	B	C	X
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

A. $X = \bar{A}\bar{B}\bar{C} + ABC + A\bar{B}C$
B. $X = ABC + ABC + ABC$
C. $X = A\bar{B}C + \bar{A}BC + AB\bar{C}$
D. $X = \bar{A}\bar{B}C + \bar{A}BC + AB\bar{C}$

Q.29) Derive the Boolean expression for the logic circuit shown below:



A. $C(A + B)DE$

B. $\left[C(A + B)D + \overline{E}\right]$

C. $\left[\left[C(A + B)D\right]\overline{E}\right]$

D. $ABCDE$

Q.30) The expression for Absorption law is given by _____

A) A + AB = A B) A + AB = B C) AB + AA' = A D) A + B = B + A

Q.31) DE Morgan's theorem states that _____

A) (AB)' = A' + B' B) (A + B)' = A' * B
C) A' + B' = A'B' D) (AB)' = A' + B

Q.32) What is the minimum number of two input NAND gates used to perform the function of two inputs OR gates?

A) One B) Two C) Three D) Four

Q.33) The gates required to build a half adder are _____

A) EX-OR gate and NOR gate
B) EX-OR gate and OR gate
C) EX-OR gate and AND gate
D) EX-NOR gate and AND gate

Q.34) **Convert the following SOP expression to an equivalent POS expression**

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

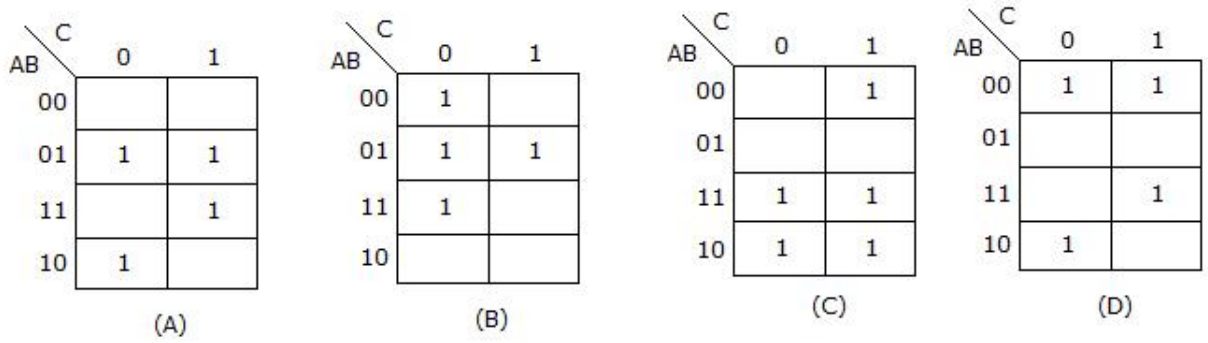
A. $(\overline{A} + \overline{B} + \overline{C})(\underline{A} + B + \overline{C})(\overline{A} + B + C)$

B. $(A + B + C)(A + \overline{B} + C)(A + \overline{B} + \overline{C})$

C. $(\overline{A} + \overline{B} + \overline{C})(A + \overline{B} + C)(A + \overline{B} + C)$

D. $(A + B + C)(\overline{A} + B + \overline{C})(A + \overline{B} + C)$

Q.35) Mapping the SOP expression $\overline{A}\,\overline{B}\,\overline{C} + \overline{A}\,B\,\overline{C} + \overline{A}\,B\,C + A\,B\,\overline{C}$, we get _____.



Q.36) Which network is suitable for a building?

A) WAN
B) LAN
C) MAN
D) PAN

Q.37) What does Router do in a network?

A) Forwards a packet to all outgoing links
B) Forwards a packet to the next free outgoing link
C) Determines on which outing link a packet is to be forwarded
D) Forwards a packet to all outgoing links except the originated link

Q.38) The device that can operate in place of a hub is a :

A. Switch
B. Bridge
C. Router
D. Gateway

Q 39) If networks use different protocols, which one of the following devices isused to link different networks?

E) Repeater
F) Hub
G) Gateway
H) Bridge

Q 40) The topology which requires a central controller or hub is

A. Mesh
B. Star

C. Bus
D. Ring

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

BLUE PRINT (FIRST TERMINAL EXAMINATION) (2022-2023)STD XII
COMPUTER SCIENCE (H-4705)

DURATION: 90 MINUTES MAX. MARKS:40

UNIT NAME	KNOWLEDGE	UNDERSTANDING	APPLICATION	TOTAL
PROGRAMMING IN C++	5(5)	12(12)	8(8)	25(25)
BOOLEAN ALGEBRA	2(2)	5(2)	3(3)	10(10)
COMPUTER NETWORKS	1(1)	2(2)	2(2)	05(05)
TOTAL	8(8)	19(19)	13(13)	40(40)
PERCENT	20%	50%	30%	100%

Note:

1) ALL THE QUESTIONS ARE VSA OF MCQ TYPE.

2) FIGURES INSIDE THE BRACKETS INDICATE THE MARKS AND OUTSIDE THE BRACKETINDICATE THE NUMBER OF QUESTION

3) UNIT I- FULL PORTION (25 MARKS)

4) UNIT V- TILL NETWORK TOPOLOGY(INCLUSIVE) (05 MARKS)

5) UNIT IV- FULL PORTION(10 MARKS)

WEIGHTAGE TO DIFFICULTY LEVEL OF QUESTIONS

SR NO.	ESTIMATED DIFFICULTY LEVEL	MARKS	PERCENTAGE
1.	EASY	08	20%
2.	AVERAGE	20	50%
3.	DIFFICULT	12	30%
4.	TOTAL	40	100%

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION
(MODEL PAPER)
SECOND TERMINAL EXAMINATION

STD: XII SCIENCE **MARKS: 30**

SUBJECT: COMPUTER SCIENCE (H-4705) **TIME DURATION: 90 MIN**

INSTRUCTIONS:- (i) All questions are compulsory.
(ii) Programs should be written in C++ only.
(iii) State your assumptions clearly.
(iv) The question paper consists of three Sections A,B and C.
Section A: Consists of 9 questions of 1 mark each.
Section B: Consists of 6 questions of 2 mark each.
Section C: Consists of 3 questions of 3 mark each.
(v) Total Number of questions is 18.
(vi) There is no overall choice, however there is an internal choice for question number 17 and 18.
(vii) Figures to the right indicate full mark.

SECTION - 'A'

1. What is Protocol?
2. Write the name of two member functions belonging to fstream class?
3. State one point of difference between ifstream and ofstream class.
4. Write a snippet of code that opens a file named "best_of_one.txt" for writing at the end only.
5. Define Array?
6. What is stack underflow?
7. What is doubly linked list?
8. If the queue is implemented with a linked list where front pointer pointing to a first node and a rear pointer pointing to a last node, which pointer/s will change during an insertion of a new node into an EMPTY queue.
9. Determine the output of the following code(assume header file is included in the code)

```
int main()
{
    int a[][]={10,20,3,45,5,60},x=100,y=15,z;
```

```
        if(a[2][0]>10)
        z=x%y>5;
        else
        z=x/y<5;
    cout<<a[z][0];
    return 0;
}
```

SECTION- 'B'

10. Write short note on TCP/IP.
11. Explain Circuit Switching technique.
12. State the purpose of following C++ file I/O class stream member functions:
    A) Seekg()
    B) Tellg()
    C) Seekp()
    D) Tellp()
13. Write a complete C++ program to count the number of words present in the text file "best.txt".
    Ex:- if the content of "best.txt is
    "just because it's hard;
    doesn't mean; it's impossible.
    you can do it."
    Then the output of the program will be:
    Total number of words in the file are:-12.
14. Explain the concept of evaluating the following postfix expression using stacks:
    5,4,3,*,+,2,3,*,2,/,-
15. Explain the concept of converting the following infix expression to postfix using stacks.
    A+B/(D-E)*F

SECTION - 'C'

16. Consider the following class declaration:

```
class student
{
 int admno;
 char name[50];
 char address[80];
char subject;//C for Comp.Sci and B for Bilogy
public:
void readdata();
void writedata();
void modifydata();
void searchrecord();
};
```

Define the member function searchrecord() of a binary file "admission.dat" to search all those records who have opted Comp.Sci as a subject.

17. Write an user defined function named "display()" which accepts a double dimensional array and its size as parameters. It further displays the lower triangular matrix.

OR

Write an user defined function named "display()" which accepts a double dimensional array and its size as parameters. It further displays the sum of all the elements in each row.

18. Consider the following class declaration

```
class linkedlist
{
        struct node
        {
                int productno;
                char pro_name[50];
```

```
            float price;
            node *link;
        }*first;
        public:
        linkedlist()
            {
                first=null;
            }
            void create();
            void sdisplay(float p);
            void display();
    };
```

Write a member function sdisplay() to display only those product details whose price is input as a parameter to a member function .

OR

```
class queue
{
        struct node
        {
                int productno;
                char pro_name[50];
                float price;
                node *link;
        }*front,*rear;
        public:
        queue()
        {
                front=rear=NULL;
        }
        void addq();
        void delq();
      void display();
};
```

Define the member function addq() to add node to the queue and display() to display the content of queue.

**********END**********

DESIGN OF THE QUESTION PAPER (SECOND TERM-2022-23)

CLASS : XII (General Stream)

Time : 1.5 Hrs. Subject : Computer Science Max. Marks :30

The weightage or the distribution of marks over different dimensions of the question paper shall be as follows:

1. Weightage to Learning Outcomes

Sr.No.	Learning Outcomes	Marks	Percentage of marks
1.	Knowledge	6	20%
2.	Understanding	18	60%
3.	Application	6	20%
4.	Skill	---	---
	Total	30	100%

2. Weightage to Content / Subject Units

Sr.No.	Units	Marks
1.	Data structure in C++	15
2.	File handling in C++	10
3.	Network (Part-II)	05
	Total	30

3. Weightage to Forms of question

Sr.No.	Forms of Question	Marks for each Question	Number of Questions	Total Marks
1.	Long Answer Type (LA)	04	---	---
2.	Short Answer Type (SA-I)	02	06	12
3.	Short Answer Type (SA-II)	03	03	09
4.	Very Short Answer Type (VSA)	01	09	09
	Total		18	30

The expected time for different type of question would be as follows:

Sr. No	Forms of Question	Approx. Time for each Question in mins (t)	Number of Questions	Approx. Time for each Question in mins (n x t)
1.	Long Answer Type (LA)	---	---	---
2.	Short Answer Type (SA-I)	07	06	42
3.	Short Answer Type (SA-II)	10	03	30
4.	Very Short Answer Type (VSA)	02	09	18
	Total		18	90

As the total time is calculated on the basis of the number of questions required to be answered and the length of their anticipated answers, it would therefore be advisable for the candidates to budget their time properly by cutting out the superfluous words and be within the expected time limits.

4. **Scheme of Options**
There will be no overall choice. However, there is an internal choice for question numbers 17 and 18.

5. Weightage to difficulty level questions:

Sr.No.	Estimated difficulty level of questions	Percentage
1.	Easy	20%
2.	Average	60%
3.	Difficulty	20%

A question may vary in difficulty level from individual to individual. As such, the assessment in respect of each question will be made by the paper on basis of general anticipation from the group as a whole taking the examination. This provision is only to make the paper balanced in its weightage, rather than to determine the pattern of making at any stage.

Signature of the Convenor