GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION MODEL QUESTION PAPER OF FINAL EXAMINATION

MAXIMUM MARKS: 70 DURATION: 180 MINUTES

SUBJECT : COMPUTER SCIENCE

STD:XII

Instructions: - 1. All questions are compulsory, however there is an internal choice for question number 31,32,34 and 35.

2. Question number from 1 to 6 should be attempted only once.

3. Programs should be written in C++only.

4. State your assumptions clearly.

Section-A consists of 12 questions of 01 mark each.

Section-B consists of 14questions of 02 marks each.

Section-C consists of 06 questions of 03 marks each.

Section-D consists of 03 questions of 04 marks each.

SECTION A

1. Write the CORRECT alternative from those given below: [1]

The art of representing essential features without including the background details or explanation is:

- Data Encapsulation
- Inheritance
- Data Abstraction
- Polymorphism

2. Write the CORRECT alternative from those given below: [1]

The default access specifier for the class members is

- Public
- Private
- Protected
- None of the Above

3. Write the CORRECT alternative from those given below: [1]

In _____ a multiple classes are derived from single base class.

- Single
- Multiple
- Multilevel
- Hierarchical

4. Write the correct alternative from those given below: - [1]

The data structure that follows First in First out mechanism is known as _____

- Stack
- Queue
- Array
- Linked List

5. Write the correct alternative from those given below: - [1]

A _____ is a device that forwards packets between networks by processing the routing information included in the packet.

- Bridge
- Fire Wall
- Router
- Hub

6. Write the correct alternative from those given below: - [1]

Most packet switches use this principle _____ .

- Stop and Wait
- Store and Forward
- Store and Wait
- Stop and Forward

7. Define Webpage. [1]

8. Identify the Domain Name in the given URL. [1]

http.//www.gbshsenic.in/aboutus.htm

9. State a difference between Bridge and Gateway. [1]

10. Define Abstract class. [1]

11. State an advantage of using default arguments. [1]

12. The total number of comparisons made in array(size-n) to obtain the elements an ascending order. [1]

13. Write short note on Coaxial Cable. [2]

14. Write short on TCP. [2]

15. State two point of difference between Circuit Switching and Packet Switching. [2]

16. State two advantages of using computer network. [2]

17. State two disadvantages of using STAR Topology. [2]

18. Write short note on Data Encapsulation. [2]

19. State two advantages of using Functions. [2]

20. Determine the output of the following program: [2]

```
#include<iostream>
using namespace std;
class Base1
{
        public:
                Base1()
                { cout << " Base1's constructor called" << endl; }
};

class Base2
```

```
{
        public:
        Base2()
        { cout << "Base2's constructor called" << endl; }
};

class Derived: public Base1, public Base2
{
        public:
                Derived()
                { cout << "Derived's constructor called" << endl; }
};

int main()
{
        Derived d;
        return 0;
}
```

21. Write a user defined function checkvowel() which accepts a string as a parameter and displays the no of vowels of each type and also displays total no of vowels in the given line of text. [2]

22. Define the following: [2]

    i) Queue ii) Linear Linked List

23. Write an algorithm for converting an infix expression to postfix. [2]

24. State any two points of differences between Single Dimensional Array and Linear Linked List. [2]

25. Explain the concept of converting infix expression to postfix using stack using the following expression.

    A * B + C – D/F

26. Write a user defined function in C++ to find the sum of all the diagonal elements of the square matrix. The function should accept the matrix of type integer and its size as arguments and return the sum. [2]

27. Write a user defined function checkspecial() which accepts a integer number as argument and returns a value 1 if it is a special no and returns 0 if it is not a special number. [3]

    NOTE: A number is said to be special number if sum of factorials of each digit of the number equals the given number.Example 145 is a special number .
    1!= 1
    4!=24
    5!= 120 sum = 1+24+120=145.

28. Determine the output of the following program: [3]

```
#include <iostream.h>
void indirect (int temp=20)
{
        for(int i=1;i<=temp;i+=5)
        cout<<i<<" ";
        cout<<endl;
}
void direct (int &num)
{
```

```
        num+=10;
        indirect(num);

int main()
{
        int number=20;
        direct(number);
        indirect();
        cout<<number<<endl;
        return 0;
}
```

29. Assume that Contents of the array are initially : 1 -1 -4 2 7 4
The contents of the array during 2nd iteration/pass is : -4 ,-1 , 1 , 2 , 7, 4
Identify the sorting algorithm applied to sort the above array.
Write an user defined function names sort() which accepts an array and its size as parameter and performs sorting using the identified sorting technique. [3]

30. Write a user defined function named matmul() which multiplies two double dimensional matrices. The Function should accept both the matrices and their orders as arguments and display an appropriate error message if the matrices cannot be multiplied. [3]

31. Given two arrays of integers of sizes M and N respectively. Write a function named MIX() which will produce a third array named C such that the resulting sequence is followed
    1) All even numbers of A from left to right are copied into C from left to right.
    2) All odd numbers of A from left to right are copied into C from right to left.
    3) All even numbers of B from left to right are copied into C from left to right
    4) All odd numbers of B from left to right are copied into C from right to left

    A , B and C are passed as arguments to MIX()
    Eg:-If A ={ 3, 2 ,1 , 7, 6, 3} and B = { 9, 3, 5, 6, 2, 8, 10}
    The resultant array C should be { 2, 6 , 6, 2, 8 , 10, 5, 3, 9 , 3, 7 , 1, 3}

OR

Write a user defined function in C++ named **"concat "** which accepts three strings S1, S2 and S3 as arguments and concatenates S1 and S2 into S3 without using Standard library function. [3]

32. Write a complete C++ procedural program to generate the following pattern. [3]

```
@@@@@
    @
  @
@
@@@@@
```

OR

Write a complete C++ procedural program to generate the following pattern

```
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

33. Define a class “Library” in c++ with the following specifications: [4]

Data Members: code – type integer
name – character array of size 20
game_name – character array of size 20
mtype – single character(P for Permanent T for Temporary)
fees - type float

Member Functions:-
A Parameterised constructor to assign the values for data members code, name, game_name and mtype.
Calculate() - to calculate fees according to the following criteria.

game_name	fees for permanent member
Cricket	1000
Tennis	2000
Badminton	3000

If the member is temporary, then fees are double of permanent member

displaydata()- To display all data members on the screen.

Write a main function to create an object of class library, assign values to object and display values on the screen.

34. Declare an abstract class named “customer “which has the following members:

i) cno: of type integer under private visibility label.
ii) display(): a function under protected visibility label to display data member “cno”.
iii) Define a constructor to initialise the data member “cno”.

Derive a class named “account” from class “customer” under public mode which has the following members:
i) deposit: of type integer under private visibility label.
ii) intr: of type float under private visibility label.
iii) display (): a function under protected visibility label to display the data members intr and deposit.
iv) Define constructor to initialise data member deposit and set intr with computed value as deposit*0.05*3.

Derive a class named “person” from class “account” under public mode. It has the following members:

i) name: a character array of size 30 under private visibility label.
ii) display(): a function under protected visibility label to display the data member name.
iii) Define a constructor to initialise the data member name.

Write a main program to create an object of class “person” to initialise data members of all classes. Use the same object to display the data members of all classes.

OR

Declare an abstract class named “account” which has the following members:
i) deposit: of type integer under private visibility label.

ii) display(): a function under public visibility label to display the data member deposit.
iii) Define constructor to initialise data member deposit.

Declare a class named "person" which has the following members:

i) a: of type customer under private visibility label.
ii) b: of type account under private visibility label.
iii) name: a character array of size 30, under private visibility label.
iv) Define a constructor to initialise the data member name.
v) display(): a function under protected visibility label to display the data member name.

Write a main program to create an object of class "person" to initialise data members of all classes. Also display the data members of all classes.

35. Consider the following class declaration:

```
struct element
{       int data;
        struct element *next;
};
typedef  struct element node;
class list
{ public: node *start;
          list(){start=NULL;}
          void creation():
          void display():
          void deletion():
 };
```

Write a function definition for deletion(), to delete a node in the linked list.

OR

Consider the following class declaration:

```
struct element
{
        int data;
        struct element *next;
};
typedef  struct element node;
class list
{ public: node *start;
  list(){start=NULL;}
  void creation():
  void reverse():
  void display():
};
```

Write a function definition for reverse(), to reverse the order of nodes in the linked list.