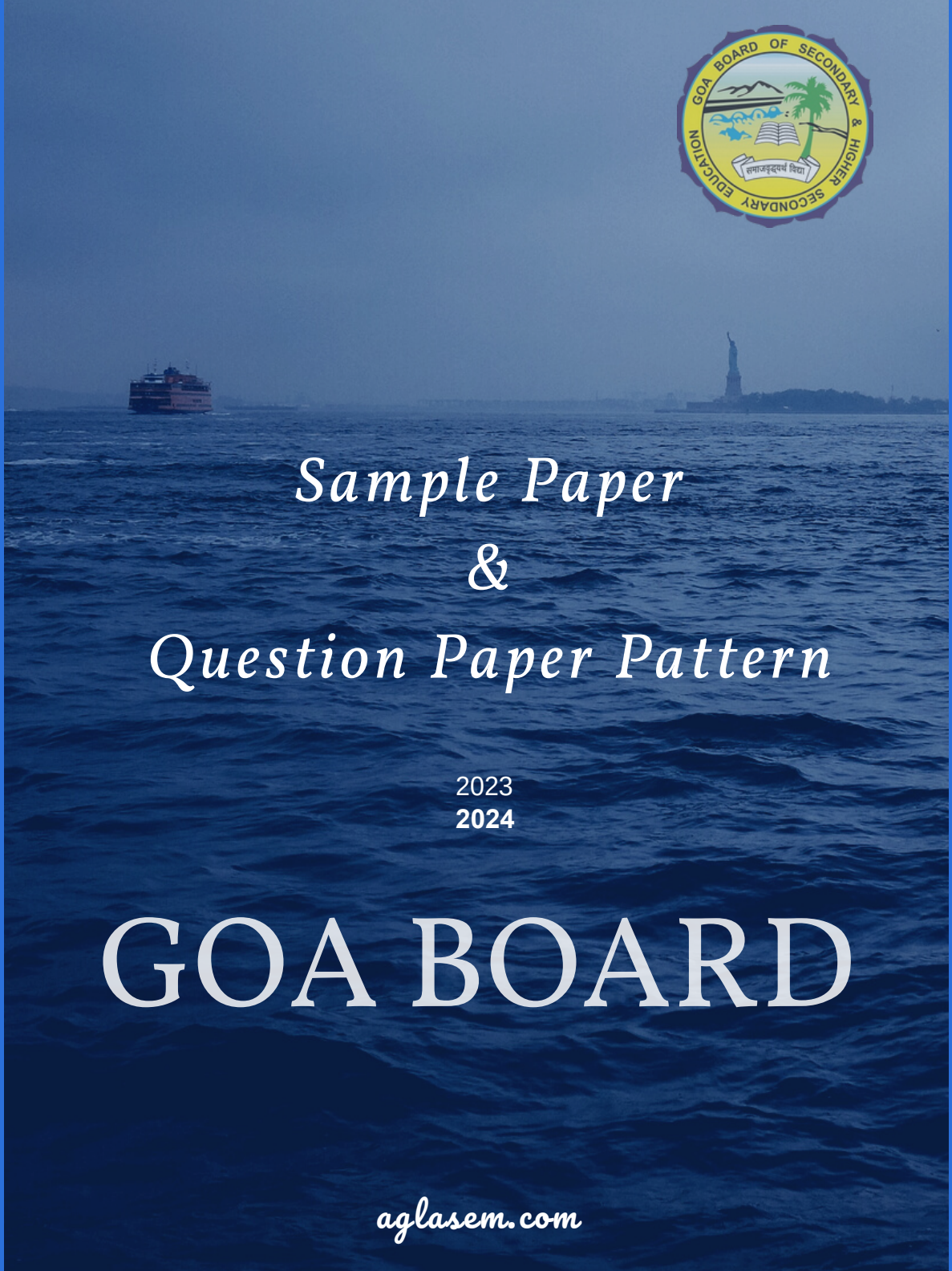


Sample Paper
&
Question Paper Pattern

2023
2024

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DESIGN OF THE QUESTION PAPER
(Final Exam 2023-24 ONWARDS)
CLASS : XII (General Stream)
Time : 2 ½ Hrs. Subject : Computer Science Max. Marks :70

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	21	30%
2.	Understanding	35	50%
3.	Application	14	20%
4.	Skill	---	---
	Total	70	100%

2. Weightage to Content / Subject Units

Sr.No.	Units	Marks
1.	Programming with C++	20
2.	Data Structures	20
3.	File Handling in C++	10
4	Boolean Algebra	10
5	Computer Networks	10
	Total	70

3. Weightage to Forms of question

Sr.No.	Forms of Question	Marks for each Question	Number of Questions	Total Marks
1	Very Short Answer Type (VSA)	01	14	14
2	Short Answer Type (SA-I)	02	10	20
3	Short Answer Type (SA-II)	03	8	24
4	Long Answer Type (LA)	04	3	12
	Total		35	70

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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	Very Short Answer Type (VSA)	2	14	28
2	Short Answer Type (SA-I)	4	10	40
3	Short Answer Type (SA-II)	6	8	48
4	Long Answer Type (LA)	11	3	34
	Total		35	150

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 25,29,34 and 35.

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.

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GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

MODEL PAPER (2023 – 2024 onwards)

STD: XII SCIENCE **MARKS: 70**

SUBJECT: COMPUTER SCIENCE (H-4705) **TIME DURATION: 2 ½ Hours**

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 , C and D.
Section A: Consists of 14 questions of 1 mark each.
Section B: Consists of 10 questions of 2 mark each.
Section C: Consists of 8 questions of 3 mark each.
Section D: consiste of 3 questions of 4 marks each

(v) Total Number of questions are 35.

(vi) There is no overall choice, however there is an internal choice for question number 25,29,34 and 35.

(vii) Figures to the right indicate full mark.

SECTION A

1. The value of X in the expression X= 3>=4?5%2:5/2 in C++ will be _____ **1**

A. 1 B. 2 C. 0 D. 3

2. The value of the postfix expression 15, 3./, 12, 6, * , - is _____ **1**

A. -72 B. 72 C. -67 D. 67

3. The initial content of the array is **1**

5	12	6	1	20	4	18	14

After second pass the content of array is

1	4	6	5	20	12	18	14

The sorting method used in the above example is _____

A. Bubble sort method B. Insertion sort method

B. Selection sort method D. Quick sort method

4. A binary file “Student.dat” is opened using the file modes ios::in , ios::out,ios::ate. The file get pointer will _____ **1**

A. be at the beginning of the file

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B. be at the end of the file
C. be at the middle of the file
D. depend upon size of the file

5. The Product Of Sum (POS) form of the boolean expression xy'z+x'y'z' is _____ **1**

A. (x+y'+z).(x'+y'+z')
B. (x'+y+z').(x+y+z)
C. (x'+y+z').(x'+y'+z')
D. (x+y'+z).(x+y+z)

6. The Device used to connect two or more dissimilar networks is called _____ **1**

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

7. The data switching technique used while browsing the information on the internet uses _____ **1**

A. Circuit Switching technique
B. Packet switching technique
C. Message switching technique
D. Internet Switching technique

8. What is Containership? **1**

9. What is a copy constructor? **1**

10. Define queue. **1**

11. Define text file. **1**

12. State Demorgans Laws in Boolean algebra. **1**

13. Define E- Commerce. **1**

14. Name the network topology in which data travels only in one direction and if any one of the node in the network fails the entire network fails. **1**

SECTION - B

15. What are inline functions? **2**

State any two advantages of using inline functions.

16. Differentiate between passing the arguments to function by value and passing the arguments to functions by reference. **2**

17. Define the following terms in C++ language **2**

i. Arrays

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ii. Pointers

18. Sort the following numbers using Insertion sort method and show the content of array after each pass **2**

12	-10	6	15	3	-8	10	8

19. Name any four functions used to move the file pointers within the file while handling the file in c++. **2**

20. Assume that a text file "Student.txt " exists . Write a c++ program to find the number of words in the file "Student.txt"; **2**

21. Draw the logic circuit diagram to obtain OR gate and AND gate using NAND gates only. **2**

22. What is network topology? State any two advantages of bus topology. **2**

23. What is email ? State any two advantages of email over conventional mail. **2**

24. Write a short note on TCP / IP. **2**

SECTION C

25. Write a complete procedural c++ program to generate the following pattern for n lines. **3**

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

OR

Write a complete procedural c++ program to generate the following pattern for n lines **3**

A

A B A

A B C B A

A B C D C B A

A B C D E D C B A

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26. Consider the following class declaration **3**

```
class A
{
   int m;
   public:
   A(int x)
   {
    m=x;
   }

};
class B:A
{
  int n;
};
class C:B
{
 int  p;
};
```

i. Write the constructor for class B to initialise the data member
ii. Write the constructor for class C to initialise the data member
iii. Write the main function to create a object of class C using appropriate values.

27. Write a complete c++ function check() which accepts a integer number as a argument , checks if the number is palindrome , and returns 1 if the number is palindrome and returns zero if the number is not palindrome. **3**

28. Write short notes on **3**

i. Binary search method
ii. Bubble sort method

29. Convert the following expression from infix to postfix form and show the content of stack after each step. **3**

A%B-C*D+E/F

OR

Evaluate the following postfix expression using stack and show the content of stack after each step. **3**

14, 5 ,%, 3, 4,*,- , 13,3,/,+

30. Write a function in c++ displaysum() which accepts a two dimensional array and its size as arguments and display sum of each column of the two dimensional matrix. **3**

31. Simplify the following Boolean expression using K map . **3**

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F(a,b,c,d)=∑(0,2,4,5,6,8,10,11,12,13,14)

32. Simplify the following Boolean expression algebraically and draw the logic circuit diagram for the simplified expression using NAND gates only. **3**

a'b'c'+a'b'c+a'bc'+ab'c'+ab'c+abc'

SECTION D

33. Consider the following class declaration and answer the following questions **4**

```
class M
{
   int  x,y;
   char  name[20];
   void getdata();
    protected:
    void putdata() ;
    public:
    int z;
   void finddata();
};
class N
{
  int p;
  void readdata();
  public:
  int q;
 void checkdata();
};
class O:M,public N
{
  int r;
  void displaydata();
 public:
 int s;
void modifydata();
};
```

i. What kind of inheritance is depicted in the above example.
ii. Name the member functions accessible to the object of class O.
iii. Name the data members accessible to the object of class O.

34. Consider following class declaration. **4**

```
class   BOOK
{
  long int bid;              // book id
   char title[ 40];          // book title
   char author[40];          //book author
```

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```
    float price;            //book price
    char type;              // book type,  A for academic N for non academic
};
```

Write a main function to Create a binary file "LIBBOOK.dat" to store n objects of class BOOK in the file and then to display all books which are of type Academic.

OR

Consider the following class declaration **4**

```
class EMPLOYEE
{
    int empid;                  // employee id
    char empname[40];           // employee name
public:
    char dept                   // employee dept
                                   A for administrative , P for production
};
```

Assume that a binary "Empdata.dat" exists and it contains objects of class EMPLOYEE.

Write a main function to create two binary files "Empadm.dat" and "Empprod.dat" , such that "Empadm.dat" will have data of employees which belongs to administrative dept and "Empprod.dat" will contain data of production department.

35. Consider the following class declaration and write a function **4**

i. create() to create a linked list with n nodes.

ii. display() to display all nodes where data is greater than 10 and less than 20.

```
class linkedlist
{
    struct node
    {
     int data;
     node *link;
    }*first;
   void create();
   void display();
 public:
   linkedlist()
  {
   first=NULL;
 }
}
```

OR

Consider the following class declaration and write functions **4**

i. addqueue() , to add an element in the queue

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ii. delqueue() , to delete an element from the queue.

```
class queue
{
  struct node
 {
    int data;
    node *link;
}*front, *rear;
       void addqueue();
        void delqueue();
       public:
       queue()
       {
          front= rear= NULL;
       }
       }
```

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MODEL QUESTION PAPER
Formative Assessment -I
Subject : COMPUTER SCIENCE

Time : 1 Hour
Total no. of questions :11

Marks: 20

INSTRUCTIONS:

1. **All programs should be written in C++ only**
2. **State assumptions clearly if any wherever required**
3. **All questions are compulsory, however Q 11 is internal choice**
4. **Figures to the right indicate marks**
5. **MCQ's are to be attempted only once**

Q1) Which of the following is IDEMPOTENT law? [1]

a) A + A` = 1
b) A + A = A
c) A + 1 = 1
d) A + 0 = 1

Q 2) which of the following is a valid function prototype with default arguments [1]

A) Void sum(int a, int b=10, int c);
B) Int sum(int r=10, float g=25.25);
C) Void input(int a, int b, int c);
D) Void data(int a=10, int b=20,int c);

Q 3) State the De Morgan's law in Boolean Algebra. [1]

Q 4) What should be the output of the following program? [1]

```
int main()
{
        float x=15;
        switch(x%2)
        {
                case 0: cout<<"even "; break;
                case 1: cout<<"odd "; break;
                default: cout<<"default";
        }
}
```

a. Compilation error
b. even
c. odd
d. default

Q 5) Guess the output generated by following program. [2]

```
#include<iostream.h>
int a=12;
void sample(int &x , int y, int z=2)
{
        x = x % z ;
        z = z + 2 ;
        y = y * 10 ;
}
int main()
{
        Int a=15, b=10, c=5;
        sample( a , b , c );
        cout<<::a<<" "<<a<<" "<<b<<" "<<c<<endl;
        fun( b, ::a );
        cout<<::a<<" "<<a<<" "<<b<<" "<<c<<endl;
}
```

Q 6) Overload a function 'volume' that would calculate and display: [2]

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- Volume of a cylinder
- Volume of a sphere

Q 7) Simplify the following using Boolean laws: [2]
F = B.(AD + (BC)')' . (A' + D')) . C

Q 8) Generate the following pattern of 'n' lines using nested for loops. [2]

X X X X X
X 0 0 0 X
X 0 0 0 X
X 0 0 0 X
X X X X X

Q 9) Give the purpose and the header files required for the following built in functions. [2]

a) strcat
b) isalnum

Q 10) Define a function 'count' that counts and displays the total number of vowels and consonants in the string passed as a parameter to it. Complete the C++ program using a suitable main function that accepts a line of text as an input from the user and later on calls the function count. [3]

Q 11) Simplify the following Boolean expression using Karnaugh Map: [3]
F (A, B, C, D)= π (0, 1, 2, 3, 4, 8, 12)

OR

Q 11) Give the Truth Table of a Full Adder and draw the circuit diagram for the same. Also derive a Boolean expression for the output 'SUM' and simplify it using Boolean laws. [3]

_____ ********** _____

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BLUE PRINT (FIRST FORMATIVE ASSESMENT)

Duration: 60 MINUTES | Maximum Marks: - 20

Subject : COMPUTER SCIENCE | Class: XII

Objectives	Knowledge				Understanding				Application				Skill				Total
Contenet Area	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
UNIT I: PROGRAMMING IN C++	2	9				5			4								6(10)
						6											
						8											
UNIT IV: BOOLEAN ALGEBRA	1					7	10				11						5(10)
	3																
	04(5)				05(11)				02(4)								11(20)

Note: ***Indicate Internal Choices**

#FIGURES INSIDE THE BRACKETS INDICATE THE MARKS AND OUTSIDE THE BRACKET INDICATE THE NUMBER OF QUESTION

Type of question	Number of question		Marks allotted
Long Answer (LA)	00		0
Short Answer I (SA-I)	05		10
Short Answer II (SA-II)	02		06
Very Short Answer (VSA)	04		04

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MODEL QUESTION PAPER
Second Formative October 2023
Subject:- COMPUTER SCIENCE
Std: XII

Time : 1 HOUR **Total no. of Questions: 11**
No. of printed pages:04 **Max. Marks: 20**

INSTRUCTIONS:

1. All questions are compulsory; However Q11 has internal choice
2. Figures to the right indicate full marks.
3. Programs must be written in C++ only.
4. State your assumptions clearly.
5. Total no of questions: 11

SECTION- A

Q1 Write the correct alternative from those given below: 1

The destructor has the same name as class but is preceded with _____

a) # b) .
c) ~ d) %

Q2 Write the correct alternative from those given below: 1

The variable that stores the address of a another variable is called _____ variable.

a)global b)pointer
c)local d)address

Q3 Consider the following c++ program and write the MISSING STATEMENT to call parameterized constructor. 1

```
#include<iostream.h>
using namespace std;
class hello
{
        int a;
        public:
        hello()
```

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```
        {               a=4;    }
        hello (int b)
        {       a=b;    }
};
int main()
{
        //MISSING STATEMENT
}
```

Q4 Define Doubly linked list. 1

SECTION- B

Q5 State two points of difference between procedure oriented programming and object oriented programming. 2

Q6 Consider the following C++ program and answer the questions below. 2

```
class doll
{
        char dcode[5];
        protected:
        float price;
        void calcprice(float)
        public:
        dolls();
        void dinput();
        void dshow();
};
Class softdolls:public dolls
{
        Char sdname[20];
        Float weight;
        Public:
        Softdolls();
        Void sdinput();
        Void sdshow();
};
Class electronicdolls:public softdolls
{

        Char edname[20];
        Char batterytype[10];
        Int batteries;
        Public:
        Electronicdolls();
```

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```
        Void edinput();
        Void edshow();
};
```

1)Which type of inheritance is shown in the above example?
2)Write the names of all data members accessible from member functions of class softdolls.
3)Write names of all member functions accessible by an object of class electronicdolls
4) Write the names of all datamembers accessible by object of class electronicdolls

Q7 Write any four characteristics of constructor. 2

Q8 Determine the output of the following C++ program 2

```
#include<iostream.h>
using namespace std;
class game
{
        int level,score;
        char type;
        public:
        game(char gtype='p')
        {
                level=1;
                score=0;
                type=gtype;
        }
        void play(int gs);
        void change();
        void show()
        {
                cout<<type<<" @ "<<level<<" "<<score<<endl;
        }
};
void game::change()
{
        type=(type=='P')?'G':'P';
}

void game::play(int gs)
{
```

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```
        score+=gs;
        if(score>=30)
        level=3;
        else if (score>=20)
        level=2;
        else
        level=1;
}
int main()
{
        game a('G'),b;
        b.show();
        a.play(11);
        a.change();
        b.play(25);
        b.show();
}
```

Q9 With reference to the given postfix expression ,explain the concept of postfix evaluation using stacks. 2

11 , 5, -, 6, 8, +, 12, *, /

SECTION- C

Q10 Write the function definition for process(int s[],int n) in c++ to add 5 in all odd values and 10 in all even values of the array s. 3

Ex: if the original contents of the array s is

S[0]	S[1]	S[2]	S[3]	S[4]
50	11	19	24	28

The modified content will be:

S[0]	S[1]	S[2]	S[3]	S[4]
60	16	24	34	38

Q11 Consider the following class declaration 3

```
class stack
{
```

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```
 struct node
 {
        char a;
        node *link;
}*top;
 public:
 stack()
  {
        top=NULL;
 }
 void push();
 void pop();
};
```

Define member function.
i)push()- to insert character in stack.
ii)pop()- to remove character from stack.

OR

Consider the following class declaration

```
class queue
{
   struct node
   {
        char a;
        node *link;
 }*front,*rear;
  public:
  queue()
   {
        front=rear=NULL;
  }
 void ins();
 void del();
};
```

Define member function.
i)ins()- to insert a node in queue.
ii)del()- to delete a node from queue.

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GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

BLUE PRINT (SECOND FORMATIVE ASSESMENT)

Duration: 60 MINUTES | Maximum Marks: - 20

Subject : COMPUTER SCIENCE | Class: XII

Objectives	Knowledge				Understanding				Application				Skill				Total
Content Area	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	VSA	SA-I	SA-2	LA	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
PROGRAMMING IN C++ (Sub Units:-07 to 10)	1	5	-	-	3	6 7 8	-	-	-	-		-	-	-	-	-	10
DATA STRUCTURE IN C++	2	-	-	-	4	9	-	-	-	-	10 11*	-	-	-	-	-	10
	03(4)				06(10)				02(6)								11(20)

Note: ***Indicate Internal Choices**

#FIGURES INSIDE THE BRACKETS INDICATE THE MARKS AND OUTSIDE THE BRACKET INDICATE THE NUMBER OF QUESTION

Type of question	Number of Question		Marks allotted
Long Answer (LA)	00		0
Short Answer I (SA-I)	05		10
Short Answer II (SA-II)	02		06
Very Short Answer (VSA)	04		04

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