

# HIGHER SECONDARY PRINCIPALS' FORUM, GOA

JOINT PRELIMINARY EXAMINATION JANUARY 2019

SUBJECT: COMPUTER SCIENCE (705)

STD: XII

MARKS : 55

DATE: 14/01/19

TIME: 2 ½ Hrs.

## INSTRUCTIONS :

- i) All questions are compulsory, however there is an internal choice for question number 22,27,28.
- ii) Question number from 1 to 5 should be attempted only once.
- iii) Programs should be written in C++ language only.
- iv) State your assumptions clearly.
- v) SECTION-A consists of 10 questions of 01 mark each.
- vi) SECTION-B consists of 11 questions of 02 marks each.
- vii) SECTION-C consists of 05 questions of 03 marks each.
- viii) SECTION-D consists of 02 questions of 04 marks each.

## SECTION A

1. Write the CORRECT alternative from those given below: [1]  
Which of the following is correct for function overloading?
  - The types of arguments are different.
  - The order of arguments is different
  - The number of argument is same.
  - Both types of arguments and order of arguments are different
2. Write the CORRECT alternative from those given below: [1]  
Stack is also called as \_\_\_\_\_ data structure.
  - Last In Last Out \* First In First Out
  - First In Last Out \* None of These
3. Write the CORRECT alternative from those given below: [1]  
The function which moves the file get pointer to the specified location in the file is:
  - \* seekp() \*seekg()
  - \* tellp() \*tellg()

4. Write the CORRECT alternative from those given below: [1]  
The dual of boolean expression  $X+X'=1$  is:  
•  $X'+X=0$       \*  $X+X=0$   
•  $X.X'=0$       \*  $X.X'=1$
5. Write the CORRECT alternative from those given below: [1]  
The protocol or program which allows user to log on to a host computer from remote computer is \_\_\_\_\_.  
\* HTTP                  \* TCP/IP  
\* TELNET                \* FTP
6. Define Abstract Class. [1]
7. State ANY ONE difference between Linear and Doubly Linked List. [1]
8. Convert the following Infix expression to Postfix:  $x + y * z + (p * q + r) * s$ . [1]
9. Define Web page. [1]
10. What is a Bridge in Computer Network? [1]

## SECTION B

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

```
#include<stdio.h>
int main()
{
    int i= -1, j=2, k=0, m;
    m = ++I || ++j && ++k;
    cout<<i<<" "<<j<<" "<<k<<" "<<m;
    return 0;
}
```
12. State ANY TWO characteristics of Destructors. [2]
13. Determine the output of the following program: [2]  

```
#include <iostream>
using namespace std;
class Sand
{
public: Sand() { cout << "Sand "; }
~Sand() { cout << "~Sand "; }
```

```

};

class Rock
{
public: Rock() { cout << "Rock "; }
~Rock() { cout << "~Rock "; }
};

class Hill: public Sand
{
    Rock data;
public: Hill() { cout << "Hill " << endl; }
~Hill() { cout << "~Hill "; }
};

int main()
{
    Hill h;
    return 0;
}

```

14. Write a user defined function named pattern() which accepts a positive integer number “n” as parameter and generates the following pattern for n lines: [2]

If n=4 then output is

1			
2	4		
3	6	9	
4	8	12	16

15. State any one difference between Stacks and Queue. [2]

16. Consider the following program:

```

#include<iostream.h>
using namespace std;
class student
{
    int roll;
    char name[30];
public: void getdata(){cin>>roll>>name;}
        void putdata(){cout<<roll<<name<<endl;}
};

int main()
{
    student x;
    fstream p;
    p.open("school.dat",ios::binary|ios::out);
        /* statement 1*/
    int bytes=_____/*statement 2*/
    int count=bytes/sizof(x);
    cout<<"The total no. of records are : "<<count;
    return 0;
}

```

Complete statement1 and statement2 to determine the total no. of records present in “school.dat”.

17. Consider a text file named “story.txt” which contains a short story typed in it. Write a program that reads the text file and determines the total no. of vowels and consonants for display. [2]

18. Draw a truth table for XNOR gate. Obtain SOP and POS expression for the same. [2]
19. Prove De Morgan's Law Algebraically. [2]
20. Write a short note on FTP. [2]
21. State ANY TWO advantages of using email over postal mail service. [2]

### SECTION C

22. Write a procedural C++ program which accepts a positive integer number from the user and determines whether the number is prime or composite. [3]

**OR**

Write a procedural C++ program which accepts a positive integer number from the user and determines summation of all its factors for display.

23. Consider the following: [3]

```
#include<iostream>
using namespace std;
class distance
{
int feet,inches;
public: distance(int x,int y) { feet=x; inches=y; }
void putdata() { cout<<feet<<inches; }
/*missing function*/
};
int main()
{int p,q;
cout<<"\nEnter the first length in feet and inches :";
cin>>p>>q;
distance a(p,q);
cout<<"\nEnter the Second length in feet and inches :";
cin>>p>>q;
distance b(p,q);
distance c(a,b);
cout<<"Total Length:"; c.putdata();
return 0;
}
```

Define ONLY the missing public member function WITHOUT changing the main function code.

24. Explain the concept of postfix evaluation using stacks with the help of following expression: [3]

5, 4, 6, +, \*, 4, 9, 3, /, +, \*

25. Consider a binary file named "address.dat" containing records of the following type: [3]

```

class school
{
int roll;
char name[30];
char city[30];
public: void getdata(); /*to accept data members*/
void putdata(); /* to display data members */
int check( char *s)
{return(strcmp(city,s));}
};

```

Write a function task () in C++ that displays all records belonging to city "panaji".

26. Obtain the simplified expression for Full Adder and draw the circuit diagram for the same. [3]

#### SECTION D

27. Declare a class named STUDENT with the following members: [4]

- i) roll: of type integer under private visibility label.
- ii) Parameterized constructor to initialize data member roll.
- iii) Display (): a function under protected visibility label to display data member roll.

Declare a class named SCHOOL with the following members:

- i) name: a character array of size 30 under private visibility label
- ii) Parameterized constructor to initialize data member name.
- iii) Display (): a function under protected visibility label to display data member name.

Declare a class named RESULT with the following members:

- i) percent: of type float under private visibility label.
- ii) X: of type student under private visibility label
- iii) Y: of type school under private visibility label.
- iv) Parameterized constructor to initialize data member percent.
- v) Display (): a function under public visibility label to display data member percent and data members of other classes also.

Write a main function to accept input values and display all the members of the classes.

**OR**

Declare an abstract class named STUDENT which has the following members:

- i) Roll: of type integer under private visibility label.
- ii) Display (): a function under protected visibility label to display data member "Roll".
- iii) Define a parameterized constructor to initialize data member roll.

Derive a class named SCHOOL from class student under protected mode which has the following members:

- i) Sname: a character array of size 30 under private visibility label.
- ii) Display (): a function under protected visibility label to display data member "Sname".
- iii) Define a parameterized constructor which initialize data member Sname.

Derive a class named RESULT from class school under protected mode. It has the following members:

- i) Percent: of type float under private visibility label
- ii) Display (): a function under protected visibility label to display data member "percent".

iii) Define a parameterized constructor which initialize data member percent.

Write a main program to create an object of class RESULT to initialize data members of all classes. Use the same object to display the data members of all classes.

28. Consider the following: [4]

```
#include<iostream>
using namespace std;
class list
{
    struct element
    {
        int data;
        struct element *next;
    };
    typedef struct element node;
    node *start;
public: list() { start=NULL; }
creation(); /*Creating a Linear Linked List*/
insertion(); /* To insert a node at a position desired by user */
display(); /* Display contents of Linear Linked List*/
};
```

Define the member function insertion ().

OR

Define the member function creation ().