

**Computer Science and Applications (CSCA)**  
**HS 2<sup>nd</sup> Year Examination, 2020**  
**Full Marks : 70**

1. Answer the following questions: 1x8=8
- (a) What is data model?
  - (b) What is a derived class?
  - (c) What is REAR in a queue?
  - (d) What is ARPANET?
  - (e) Mention the full form of http.
  - (f) What is a class in C++.
  - (g) Mention one web browser.
  - (h) How a pointer is defined in C++?
2. Answer the following questions: 2x10=20
- (a) Define polymorphism.
  - (b) What is the role of default constructor?
  - (c) Draw AND and OR gates with example.
  - (d) Mention DeMorgan's theorem of Boolean algebra.
  - (e) Mention the difference between public and private members.
  - (f) What is bandwidth of a transmission channel?
  - (g) What do you mean by domain and tuple.
  - (h) Define Firewall.
  - (i) What are DDL and DML?
  - (j) Define primitive data structure.
3. (a) Write an algorithm for the evaluation of PREFIX expression. 3
- (b) Define the constructors for the following definitions: 3
- ```
Class A {
    int x;
    float y;
    public :
        A (int, float)
        :
};
Class B : public A
{
    public:
        :
};
```
- (c) What is an array? How do you insert an element in an array? 3

(d) Write the SQL commands to create a table (EMPLOYEE) with the following attributes.

|                                         |             |   |
|-----------------------------------------|-------------|---|
| Emp_ID                                  | integer     |   |
| Name                                    | Char (40)   |   |
| Address                                 | Varchar(50) |   |
| Dept                                    | Char(20)    |   |
| Set Emp_ID as primary key of the table. |             | 3 |

Or

Discuss briefly about primary key, alternate key and candidate key. 3

(e) What is a database? Mention three level architecture of database. 3

(f) What are SOP and POS in Boolean algebra? Explain with truth table. 3

(g) Write a C++ function to find the sum of the elements of a linear array. 3

(h) What do you mean by inheritance? Mention different types of inheritance. 3

(i) Mention the characteristics of any three transmission media. 3

4. What is a destructor? How it is declared? Mention any three characteristics of destructors. 5

5. What is a stack? Briefly discuss about PUSH and POP operations of a stack. 5

Or

Write a C++ program to search a given ITEM in an array using binary search technique. 5

6. What is Computer networking? Distinguish between LAN and WAN. 5

Or

Mention advantages of Tree and Star topologies in networking. 5

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# **COMPUTER SCIENCE and APPLICATION (CSCA)**

HIGHER SECONDARY (2<sup>nd</sup> year) EXAMINATION, 2020-21

FULL MARKS: 70

TIME: 3 hours

1. Answer the following questions (1X8=8)
  - a. Write the full form of GPRS
  - b. What is data encapsulation?
  - c. Define Data Abstraction
  - d. Write the difference between Base Class and Derived Class
  - e. What is object?
  - f. What is data dictionary?
  - g. Give an example of Web Browser
  - h. Write one advantage of Object Oriented programming (OOP)
  
2. Answer the following questions (2X10=20)
  - a. Write the differences between Abstract class and Concrete class.
  - b. What is function overloading and why is it needed?
  - c. What is the need for constructor and destructor?
  - d. What are DDL and DML?
  - e. Write any two disadvantages of Ring Topology.
  - f. Distinguish between LAN and WAN.
  - g. Explain the role of router in Networking.
  - h. Differentiate between Internet and Intranet.
  - i. What is Call by Reference and Call by Value?
  - j. Write the use of the SELECT command in SQL along with its syntax.
  
3. A. Why do we need SQL constraints? Define any two such constraints. (2+1=3)  
B. What is recursion? Explain with an example. (2+1=3)  
C. Write a query on the customers table whose output will exclude all customers with a rating  $\leq 100$ , unless they are located in Guwahati (3)  
Or  
Verify the following using Truth Table:  $X(Y+Z)=XY+XZ$

D. Find the output of the following program: (3)

```
#include<iostream.h>
void main()
{
    int U=10, V=20;
    for (int i=1;i<=2;i++)
    {
        cout<<"[1]"<<U++<<"&"<<V-5<<endl;
        cout<<"[2]"<<V++<<"&"<<U+2<<endl;
    }
}
```

E. What are the advantages and disadvantages of inline functions? (1.5X2=3)

F. Explain any three network topologies (3)

G. How does inheritance influence the working of constructors and destructors? (3)

H. Identify the error in the following code:

```
#include<iostream.h>
int main ()
{
    int x[]={1,2,3,4,5};
    for (int i=0;~i<5;i++)
    {
        cout<<*x;
        x++;
    }
    return 0;
}
```

I. Write an algorithm to implement Bubble Sort in Array (3)

Or,

Write an algorithm to implement Selection sort in Array

4. Write a program in C++ to find the sum of two matrices (5)

Or,

Explain the various types of inheritance available in C++

5. What is Network Security? Explain in brief about firewall in networking. (2+3=5)

6. Determine the postfix form of the following: (2.5X2=5)

a.  $(A+B)XC/D$

b.  $A+[(B+C)+(D+E)*F]/G$

Or,

Write a C++ program to implement merge sort