

**Computer Science
Class XII**

Duration: 3 Hours

Maximum Marks : 70

Instructions :

- i) All questions are compulsory.
 - ii) Programming language : C++.
1. (a) Which feature of OOP is implemented by function overloading? Explain. 2
- (b) Name the header files, to which the following built-in functions belong to: 1
- (i) isupper() (ii) isalpha()
- (c) Identify and correct the error(s) in the following program: 2
- ```
#include<iostream.h>
void main()
{
 float class = 10.7;
 float y;
 y=class % 5.0;
 cout<<class<<" "<<y;
}

```
- (d) Give the output of the following program: 2
- ```
#include<iostream.h>
void main()
{
    float K;
    K=(float) 2 + 7 / (float) 3;
    Cout<<" value = "<<K;
}

```
- (e) In the following function Somefn is a part of some class. Assume that arguments a and b are greater than 0 when the function is invoked. 3
- ```
int Somefn(int a, int b)
{
 int ans, sm, la;
 if(a<b)
 {
 sm=a;
 la=b;
 }
 else
 {
 sm=b;
 la = a;
 }
 ans = la;
}

```

```
while(ans % sm!=0)
ans+=la;
return (ans);
}
```

- (i) What will the function Somefn(7,5) return?
- (ii) What will the function Somefn(6,8) return?

(f) What are the first and last values of i output by this loop? 2

```
N=10;
I=0;
While(I++ <N)
{
cout<< I <<endl;
}
```

2. (a) What do you mean by overloading of a function? What is the importance of function overloading? 2

(b) Define a class employee with the following specification: 4

private members of the class **employee**

- empno            integer
- ename            20 character
- basic,hra,da    float
- netpay           float

Calculate()    A function to find basic+hra+da with float return type.

Public member of the function of class employee

havedata() function to accept values for empno, ename, basic, hra, da and invoke calculate() to calculate netpay.

dispdata() function to display all the data members on the screen.

(c) Consider the following declarations and answer the questions given below: 4

```
Class World
{
int H;
Protected:
Int S;
Public:
Void input(int);
Void output();
};
class Country : private World
{
int T;
protected:
int U;
public:
void INDATA(int,int);
void OUTDAT();
```

```

}
class State : public Country
{
 int M;
public:
 void Display(void);
};

```

- (i) Name the base class and derived class of the class Country.
  - (ii) Name the data member(s) that can be accessed from function Display().
  - (iii) Name the member function(s), which can be accessed from the objects of class State.
  - (iv) Is the member function Output() accessible by the objects of the class Country?
- (d) What do you understand by constructor and destructor functions used in classes?  
How are these functions different from other member functions? 2
3. (a) What is the difference between put() and write()? 2  
 (b) Distinguish between ios :: out and ios :: app. 2  
 (c) Name the stream classes supported by C++ for file input and output. 2  
 (d) Differential between getline() and get() function. 2
4. (a) Each element of an array DATA[10][10] requires 8 bytes of storage. If base address of array DATA is 2000. Determine the location of DATA[4][5], when the array is stored (i) Row wise (ii) Column wise. 3  
 (b) What is the pre-condition for applying binary search algorithm? 2  
 (c) Differentiate between a LIFO and FIFO list. 1  
 (d) Write a User defined function in C++ to display the sum of left diagonal elements in a two dimensional array. 2  
 (e) Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation: 3  
 50, 40, +, 18, 14, -, 4, \*, + ;

5. (a) Given the following student relation:

**STUDENT**

| No. | Name     | Age | Department | Dateofadmission | Fee | Sex |
|-----|----------|-----|------------|-----------------|-----|-----|
| 1   | Richard  | 24  | Computer   | 10-01-97        | 120 | M   |
| 2   | Angelio  | 21  | History    | 24-03-1998      | 200 | F   |
| 3   | Brumpet  | 22  | Hindi      | 12-12-1996      | 300 | M   |
| 4   | Carino   | 25  | History    | 01-07-1999      | 400 | F   |
| 5   | Silvers  | 22  | Hindi      | 05-09-1997      | 250 | M   |
| 6   | Michele  | 30  | History    | 27-06-1998      | 300 | M   |
| 7   | John     | 34  | Computer   | 25-02-1997      | 210 | M   |
| 8   | Natolina | 23  | Hindi      | 31-07-1997      | 200 | F   |

**Write SQL commands for (b) to (g) and write output for (h)**

- (b) To show all information about the students of History department. 1
- (c) To list the names of Female students who are in Hindi Department. 1
- (d) To list names of all students with their date of admission in ascending order. 1
- (e) To display Student's Name, Fee, Age for male students only. 1
- (f) To count the number of student with Age<23. 1
- (g) To insert a new row in the in the Student table with the following data: 2  
 9, "Marcius", 34, "Computer", {12-03-97}, 230, "M"
- (h) Give the output of the following SQL statements:
- (i) Select COUNT(DISTINCT Department) from STUDENT: 1
- (ii) Select MAX(Age) from STUDENT Where Sex="F": 1
- (iii) Select AVG(Fee) from STUDENT Where Dateofadmission<{01/01/98}: 1
- (iv) Select SUM(Fee) from STUDENT Where Dateofadmission(>)01/01/98}: 1
6. (a) State Demorgan's Theorem. Verify the law using Truth table. 2
- (b) Prove  $(x+y)(x+z)=x+xz$  algebraically. 2
- (c) Write the dual of the Boolean Expression  $(x+y).(x'+z').(y+z)$ . 2
- (d) Minimise the following Boolean expression using K-Map. 4  
 $F(w,x,y,z) = \sum(0,2,7,8,10,15)$
- (e) Write sum of product form of the function  $F(x,y,z)$ . The truth table representation 4  
 F is given below:
- | X | Y | Z | F |
|---|---|---|---|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 1 |
7. (a) Write the full form of 2
- (i) HTML      (ii) GSM      (iii) MODEM      (iv) TCP/IP