



**INDIAN SCHOOL SOHAR**  
**TERM – 1 EXAMINATION (2019 – 20)**  
**COMPUTER SCIENCE**

**CLASS: XII**  
**DATE: 29/10/2019**  
**HOURS**

**MAX. MARKS: 70**  
**DURATION: 3**

**Question1**

- a) Write the names of any four fundamentals data types of C++. 2
- b) Write the names of the correct header files, which must be included in the following C++ code to compile the code successfully: 1
- ```
void main()
{
    char L[] = "CS 2018";
    int N = strlen(L);
    cout << L[N-1];
}
```
- c) Rewrite the following C++ program after removing any/all syntactical error(s). Underline each corrections done in the code. (**Note: Assume all required header files are already included in the program:**) 2
- ```
#define Area(L,B) = L * B
Recta
{
    int Length, Breadth;
};
void main()
{
    Recta R = [10, 15];
    cout << Area(Length.R, Breadth.R);
}
```
- d) Find the possible output of the following C++ code from options (i) to (iv). Also write the minimum and maximum values that can be possible assigned to variable End. (**Note: Assume all required header files are already included**) 2
- ```
void main()
{
    randomize();
    int A[] = {10, 20, 30, 40, 50, 60, 70, 80};
    int Start = random(2) + 1;
```

```

int End = Start + random(4);
for(int i = Start; i <= End; i++)
    cout << A[i] << "$";
}

```

|                        |                           |
|------------------------|---------------------------|
| (i) 10\$20\$30\$       | (ii) 20\$30\$40\$50\$60\$ |
| (iii) 30\$40\$50\$60\$ | (iv) 40\$50\$60\$70\$     |

e) Find and write the output of the following C++ program code:

3

**Note: Assume all header files are already included in the program**

```

void Convert(float &a, int b = 2)
{
    a = a / b;
    b = a + b;
    cout << a << " * " << b << endl;
}
void main()
{
    float m = 15, n = 5;
    Convert(m, n);
    Convert(n);
    Convert(m);
}

```

f) Find and write the output of the following C++ code: (**Assume all required header files are included**)

2

```

void Changer(char Text[])
{
    for(int c = 0; Text[c] != '\0'; c++)
        if(Text[c] > 'A' && Text[c] <= 'M')
            Text[c] += 2;
        else if(Text[c] >= 'U')
            Text[c] -= 3;
        else
            Text[c]++;
}
void main()
{
    char str[] = "MODULE";
    Changer(str);    cout << str << endl;
}

```

## Question 2

- a) Given the class Test and assuming all necessary header file(s) included, answer the questions (i) & (ii). 2

```
class Test
{
    int marks; char tname[20];
public:
    Test(int m)    //Function 1
    {    Marks = m;    }
    Test(char s[]) //Function 2
    {    strcpy(tname, s);    }
    Test(char s[], int m) //Function 3
    {    marks = m;
        strcpy(tname, s);    }
    Test(Test &t) //Function 4
    {    marks = t.marks + 10;
        strcpy(t.tname, tname);    }
};
void main()
{
    Test t1(10);                //Statement 1
    Test t2(70);                //Statement 2
    Test t3(30, "PRACTICAL");   //Statement 3
    _____;                //Statement 4
}
```

- i. Which of the statement(s) out of 1, 2, 3 or 4 is/are incorrect for object(s) of the class Test?  
ii. What is Function 4 known as? Write Statement 4 that would execute Function 4.
- b) Which function(s) out of the following can be considered as overloaded function(s) in the same program? Also, write the reason for not considering the other(s) as overloaded function(s). 2

```
void Execute(char A, int B);    //Function 1
void Execute(int A, char B);    //Function 2
void Execute(int P=10);        //Function 3
void Execute();                //Function 4
void Execute(int A);           //Function 5
void Execute(int &k);          //Function 6
```

- c) Write the definition of a class CONTAINER in C++ with the following description: 4

### Private Members

```
radius, height //float
type           //int (Type = 1 for cone, Type = 2 for cylinder)
```

```

volume          //float
calVolume()     //Member function to calculate volume as per the Type

```

| Type | Formulae to calculate Volume               |
|------|--------------------------------------------|
| 1    | $3.14 * \text{radius} * \text{height}$     |
| 2    | $(3.14 * \text{radius} * \text{height})/3$ |

### Public Members

getValues() – function to allow user to enter values of radius, height and type. Also call function calVolume()  
showAll() – function to display radius, height, type and volume of container

d) Answer the questions (i) to (iv) based on the following:

4

```

class Teacher
{
    int TCode;
protected:    char Name[20];
public:
    Teacher();
    void Enter();
    void Show();
};
class Course
{
    int Id;
protected:
    char Title[30];
public:
    Course();
    void Initiate();        void Display();
};
class Schedule : public Course, private Teacher
{
    int DD, MM, YYYY;
public:
    Schedule();
    void Start();
    void View();
};
void main()
{
    Schedule S;
}

```

- i. Which type of Inheritance out of the following is illustrated in the above example?  
Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance
- ii. Write the names of all the members, which are directly accessible by the member function View() of class Schedule.
- iii. Write the names of all the members, which are directly accessible by the object S of class Schedule declared in the main() function.
- iv. What will be the order of execution of the constructors, when the object S of class Schedule is declared inside the main() function?

### Question 3

- a) Write a user defined function AddSevenNine(int P[], int N) in C++, which should find sum of those values in array P, which are ending with 7 or 9. 2  
 For eg.: if array has following element, P[] = {27, 18, 24, 39, 9}  
 Then the function should display the output for sum of 27, 39 and 9 as Sum = 75

- b) Write a definition for a function UpperHalf(int Mat[4][4]) in C++, which displays the elements in the same way as per the example shown below: 3

The function should display:

25 24 23 22

20 19 18

|    |    |    |    |
|----|----|----|----|
| 25 | 24 | 23 | 22 |
| 20 | 19 | 18 | 17 |
| 15 | 14 | 13 | 12 |
| 5  | 4  | 3  | 2  |

- c) Let us assume T[10][15] is a 2D array, which is stored in the memory along the row with each of its element occupying 4 bytes. Find the address of the element T[5][7], if the address of the element T[7][10] is 35000. 3
- d) Write the definition of a member function AddPacket() for a class QUEUE in C++, to remove/delete a packet from a dynamically allocated QUEUE of packets considering the following code is already written as a part of program. 4

```

struct Packet
{
    int PID;      char Address[20]; Packet *LINK;
};
class QUEUE
{
    Packet *Front, *Rear;
public:
    QUEUE() { Front = NULL;  Rear = NULL;}
    void AddPacket();
    void DeletePacket();
  
```

```
~QUEUE();
```

```
};
```

- e) Convert the following infix expression to its equivalent postfix expression, showing the stack contents for each step of conversion:  $U - V/W * X + Y$

2

#### Question 4

- a) A text file named WORDS.txt contains some text. Write a user defined function MAGICWORDS() in C++ to read and display those words, which is starting with alphabet 'A' (irrespective of case of alphabet).

3

For eg: if the file WORDS.txt contains: A lot of adorable cute dolls are displayed.

Anya had boxes of Pizza.

The function should display: A, adorable, are, Anya

- b) Write a user defined function TotalPrice() in C++ to read each object of a binary file STOCK.dat and display the name from all such records whose price is above 150. Assume that the file STOCK.dat is created using objects of class Stock, which is defined below:

2

```
class Stock
{
    char name[20];    float price;
public:
    char* RName() { return name; }
    float RPrice() { return price; }
};
```

- c) Find the output of the following C++ code considering that the binary file SCHOOLS.dat exists with the following records of 10 schools:

1

| SCode | SName                 | NOT |
|-------|-----------------------|-----|
| 1001  | Brains School         | 100 |
| 1003  | Child Life School     | 115 |
| 1002  | Care Share School     | 300 |
| 1006  | Childrens Academy     | 50  |
| 1005  | Doon School           | 195 |
| 1004  | Play School           | 140 |
| 1010  | Innovate Excel School | 300 |
| 1008  | Premier Education     | 200 |
| 1011  | Uplifted Minds School | 100 |
| 1012  | Eurokids School       | 95  |

```
class SCHOOL
{
    int SCode;    char SName[20];    int NOT; // NOT is Number of Teachers
public:
```

```

void display()
{   cout << SCode << "#" << SName << "#" << NOT << endl;   }
int RNOT() { return NOT; }
};
void main()
{
    ifstream SFIN;
    SFIN.open("SCHOOLS.dat", ios::binary | ios::in);
    SCHOOLS s;
    SFIN.seekg(5 * sizeof(s));
    SFIN.read( (char *)&s, sizeof(s) );
    s.display();
    cout << "Record : " << SFIN.tellg() / sizeof(s) + 1 << endl;
    SFIN.close();
}

```

**Question 5**

- a) A table "student" has 3 columns and 10 rows and another table "studinfo" has the same number of columns and 15 rows. 5 rows are common in both the tables. If we take union, what is the degree and cardinality of the resultant table? 2
- b) Write SQL queries for (i) to (iv) and find the outputs for SQL queries (v) to (viii), which are based on the tables. 6

**Table: ACCOUNT**

| ANO | ANAME          | ADDRESS    |
|-----|----------------|------------|
| 101 | Prerna Shah    | Bangalore  |
| 102 | Arvinder Gupta | Chennai    |
| 103 | Sejal Mandalik | Hyderabad  |
| 104 | Aditya         | Chennai    |
| 105 | Simmy          | Chandigarh |

**Table: TRANSACT**

| TRNO | ANO | AMOUNT | TYPE     | DOT        |
|------|-----|--------|----------|------------|
| T001 | 101 | 2500   | Withdraw | 2017-12-21 |
| T002 | 103 | 3000   | Deposit  | 2017-06-01 |
| T003 | 102 | 2000   | Withdraw | 2017-05-12 |
| T004 | 103 | 1000   | Deposit  | 2017-10-22 |
| T005 | 101 | 12000  | Deposit  | 2017-11-06 |

- (i) To display details of all transactions of TYPE Deposit from the table TRANSACT.
- (ii) To display the ANO and AMOUNT of all Deposits and Withdrawals done in the month of October 2017 from table TRANSACT.

- (iii) To display the last date of transaction (DOT) from the table TRANSACT for ANO as 103.
- (iv) To display all ANO, ANAME and DOT of those persons whose have done transactions less than or equal to 3000
- (v) Select ANO, ANAME from Account where Address NOT IN ('Chennai', 'Bangalore');
- (vi) Select DISTINCT ANO from TRANSACT;
- (vii) Select ANO, COUNT(\*), MIN(AMOUNT) from TRANSACT GROUP BY ANO HAVING COUNT(\*) > 1;
- (viii) Select Count(\*), SUM(Amount) from TRANSACT Where DOT <= '2017-06-01';

**Question 6**

- a) State any one Distributive Law of Boolean Algebra and verify it using truth table. 2
- b) Draw the logic circuit of the following Boolean expression:  $U' + V \cdot W' + R$  2
- c) Derive the canonical POS expression for a Boolean function F, represented by the following truth table: 1

| P | Q | R | F(P, Q, R) |
|---|---|---|------------|
| 0 | 0 | 0 | 0          |
| 0 | 0 | 1 | 1          |
| 0 | 1 | 0 | 1          |
| 0 | 1 | 1 | 0          |
| 1 | 0 | 0 | 1          |
| 1 | 0 | 1 | 0          |
| 1 | 1 | 0 | 1          |
| 1 | 1 | 1 | 0          |

- d) Reduce the following Boolean expression to its simplest form using K-Map: 3  
 $F(A, B, C, D) = \Sigma (2, 5, 6, 7, 8, 9, 10, 11, 14, 15)$

**Question 7**

- a) Write advantages and disadvantages (2 each) of fibre optic cables. 2
- b) Explain star topology. Write one advantage and disadvantage each. 3
- c) What is the difference between Packet switching and Circuit switching techniques? 1
- d) Write the full form of the following networking and communication terms: 2
  - PPP                      • HTTP                      • GSM                      • FTP
- e) Give two differences between 3G and 4G telecommunication technologies. 2