

AMRITA VIDYALAYAM

AMRITA PRE BOARD EXAMINATION 2017 -'18

Class : XII

Marks : 70

Time : 3 hrs

COMPUTER SCIENCE (NO. 083)

GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. Programming Language: C++.

1.a) Write the type of C++ tokens (keywords or user defined identifiers) from the following. 2
(i) New (ii) Break (iii) Exam (iv) Switch

b) Observe the following program very carefully and write the names of those header file(s), which are essentially needed to compile and execute the following program successfully. 1

```
void main()
{
char T[] = "EXAMINATION";
for(int i= 0; i<strlen(T); i++)
T[i] = T[i]+1;
cout<<T<<endl;
}
```

c) Observe the following C++ code very carefully and rewrite it after removing any / all syntactical errors with each correction underlined.

Note: Assume all required header files are already being included in the program. 2

```
void main()
{
    char color;
    cout<<"Enter the colour code";
    cin>>color;
    switch(color);
    case B      cout<<"Black";Break;
    case W      cout<<"White;Break;
}
```

d) Find the output of the following code.

All the header files are already included in the code, which are required to run the code. 2

```
void main()
{
    char *txt="SHAKTI";
    int *ptr,N={10,20,30,40};
    *ptr=N;
    cout<<*ptr<<"@"<<txt<<endl;
    txt++;
    ptr++;
    cout<<*ptr<<"@"<<txt<<endl;
}
```

e) Answer the questions (i) and (ii) after going through the following code segment.

```
float area(float a,float b)
{
    return a*b;
}
float area(float a)
{
```

```

        return a*a;
    }
void main()
{
    int s1,s2;
    cout<<area(s1);          //Function 1
    cout<<area(s1,s2);      //Function 2
}

```

(i) Out of the following, which of the option is correct for calling Function 2? **1**

Option 1-area(10);

Option 2- area(10,20);

Option 3-area():

(ii) Name the feature of Object Oriented Programming, which is illustrated by Function 1, Function 2. **1**

f) Write the output of the following C++ program code.

Note: Assume all required header files are already being included in the program. **3**

```

Class Eval
{
    char Level;
    int Point;
public:
    Eval() {Level='E'; Point=0;}
    void Sink(int L)
    {
        Level-=L;
    }
    void Float(int L)
    {
        Level+=L;
        Point++;
    }
    void Show()
    {
        cout<<Level<<"#"<<Point<<endl;
    }
};
void main()
{
    Eval E;
    E.Sink(3);
    E.Show();
    E.Floats(7);
    E.Show();
    E.Sink(2);
    E.Show();
}

```

2.a) What is the difference between Actual Parameter and Formal Parameter? **2**

b) Answer the following questions (i) and (ii) after going through the following class. **2**

```

class School
{
    int regid;
public:
    School() //Function 1
    {
        regid=078;
    }
}

```

```

School(int rid)    //Function 2
{
    regid=rid;
}
~School()          //Function 3
{
    cout<<"Finished";
}

```

};

(i) As per Object Oriented Programming, which concept is illustrated by function1 and Function 2 together?

(ii) What is Function 3 specifically referred as? When do you think Function 3 will be invoked / called?

c) Define a class Candidate in C++ with the following specification. 4

Private Members:

- // Rno of type long
- // Name of type string
- // Score of type float
- // Remarks of type string
- A member function AssignRem() to assign the remarks as per the score obtained by the candidate. Score range and the respective remarks are shown as follow:

Score	Remarks
>=50	Pass
<50	Fail

Public Members:

- A function Enter () to allow user to enter values for Rno, Name, Score and call function AssignRem() to assign grade.
- A function Display () to allow user to view the content of all data members.

d) Answer the questions (i) to (iv) based on the following code segment. 4

```

class One
{
    int X1;
    protected:float X2;
    public:One();
        void Enter1();
        void Display1();
        ~One ();
};
class Two : private One
{
    int Y1;
    protected:float Y2;
    public:
        Two();
        void Enter2();
        void Display();
        ~Two ();
};
class Three : public Two
{
    int Z1;
    public:
        Three();
        void Enter3();
}

```

```

        void Display();
        ~Three ();
};
void main()
{
    Three T;                //Statement 1
    _____;           //Statement 2
}

```

- (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 member functions, which are directly accessible by the object T of class Three as declared in main() function.
- (iii) Write Statement 2 to call function Display() of class Two from the object T of class Three.
- (iv) What will be the order of execution of the destructors, when the object T of class Three is declared inside main()?

3.a) Write a function SWAP2BEST (int A[], int S) in C++ to modify the content of the array in such a way that the elements, which are multiples of 10 swap with the value present in the very next position in the array. 2

For example:
If the content of array A is

90	56	45	20	34	54
----	----	----	----	----	----

The content of the array A should become

56	90	45	34	20	54
----	----	----	----	----	----

b) Write a function CHANGESALARY (float Salary[], int N) in C++, which should modify each element of the array Salary having N elements, as per the following rules. 3

Existing Salary Values	Required Modification
If less than 10000	Add 50% in the existing value
If >=10000 and <20000	Add 25% in the existing value
If >= 20000	Add 10% in the existing value

c) An array T[50][20] is stored in the memory along the column with each of the elements occupying 4 bytes. Find out the base address and address of element T[30][15], if an element T[25][10] is stored at the memory location 9800. 3

d) Write the definition for member function POP() in C++, to delete a book from a dynamic stack of TEXTBOOKS considering the following code is included in the program. 4

```

struct TEXTBOOKS
{
    int Bno;
    char Title[50];
    TEXTBOOKS *post;
};

```

e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion. 2

(A+B)*C-D/E

4.a) Write a function in C++ to read the content of a text file "CITY.TXT" and display all those lines on screen which either starting with 'I' or starting with 'U'. 2

b) Given a binary file TELEPHONE.Dat containing records of the following class Directory. 3

```
class Directory
{
    char Name[20];
    char Address[30];
    charAreacode[5];
    charPh_no[15];
public:
    void Register();
    void Show();
    int Check(char AC[])
    {
        return strcmp(Areacode, AC);
    }
};
```

Write a function COPY543() in C++, that would copy all those records having AreaCode as "543" from TELEPHONE.DAT to TELEBACK.DAT.

c) Find the output of the following C++ code considering that the binary file MEM.DAT exists on the hard disk with a data of 2000 members. 1

```
class Member
{
    char mcode[10];
    char Mname[20];
    int mid;
public:
    void Register();
    void Display();
};
void main()
{
    fstream Mf;
    Mf.open("MEM.DAT", ios::binary | ios::in);
    Member m;
    Mf.read((char*)&m, sizeof(m));
    cout << "Rec: " << Mf.tellg() / sizeof(m) + 1 << endl;
    Mf.read((char*)&m, sizeof(m));
    Mf.read((char*)&m, sizeof(m));
    cout << "Rec: " << Mf.tellg() / sizeof(m) << endl;
    Mf.close();
}
```

5.a) Observe the following PARTICIPANTS and EVENTS tables carefully and write the name of the RDBMS operation which will be used to produce the output as shown in the RESULT? Also find the Degree and Cardinality of the result. 2

Table : PARTICIPANTS

PNO	NAME
1	Anil Kumar
2	Jagan Singh
3	Kausik

Table : EVENTS

EVENTCODE	EVENTNAME
1001	IT Quiz
1002	Group Debate

Table : RESULT

PNO	NAME	EVENTCODE	EVENTNAME
1	Anil Kumar	1001	IT Quiz
1	Anil Kumar	1002	Group Debate
2	Jagan Singh	1001	IT Quiz
2	Jagan Singh	1002	Group Debate
3	Kausik	1001	IT Quiz
3	Kausik	1002	Group Debate

b) Write MySQL queries for (i) to (iv) and find outputs for (v) to (viii) based on the tables.

6

Table : GAMES

GCode	Game_Name	Type	Number	Prize_Money	Schedule_Date
101	Carom Board	Indoor	2	5000	23-Jan-2004
102	Badminton	Outdoor	2	12000	12-Dec-2003
103	Table Tennis	Indoor	4	8000	14-Feb-2004
105	Chess	Indoor	2	9000	01-Jan-2004
108	Lawn Tennis	Outdoor	4	25000	19-Mar-2004

Table : PLAYER

PCode	Name	GCode
1	Ram Shankar	101
2	Ravi Sahai	108
3	Jatin	101
4	Narendra	103

(i) To display the names of all Games with their GCodes.

(ii) To display the details of those Games which are having Prize_Money more than 7000.

(iii) To display the content of the GAMES table in ascending order of Schedule Date.

(iv) To display sum of Prize_Money for each types of Games.

(v) `SELECT COUNT (DISTINCT Number) from GAMES;`

(vi) `SELECT MAX (ScheduleDate), MIN (ScheduleDate) from GAMES;`

(vii) `SELECTNAME, Game_Name from Games G, Player P where (G.Code=P.Code AND G.Prize_Money>100000);`

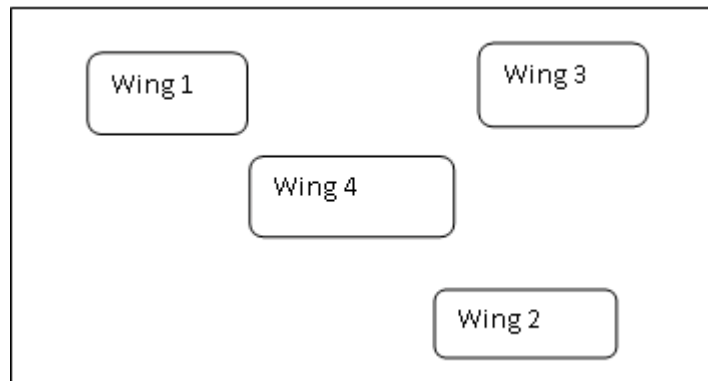
(viii) `SELECT DISTINCT GCode From PLAYER;`

6.a) 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	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

- b) Verify the following using Boolean Laws. 2
 $U' + V = U'V' + U' \cdot V + U \cdot V$
- c) Draw the Logic Circuit for the following Boolean Expression. 2
 $Y = AB + B'C + C'A'$
- d) Reduce the following Boolean Expression to its simplest form using K-Map. 3
 $F(X, Y, Z, W) = \sum (0, 1, 4, 5, 6, 7, 8, 9, 11, 15)$
- 7.a) Expand the following. 2
 (i) URL (ii) GSM (iii) GPRS (iv) POP3
- b) Differentiate between repeater and routers. 2
- c) Define Cyber Law. 1
- d) What are cookies in the context of computer networks? 1
- e) The cyber Sprouts has set up its new branch at kollam for its office and web based activities. It has 4 wings of buildings as shown. 4



Distances between various Wings.

Wing1 to Wing4	2km
Wing2 to Wing4	1.5km
Wing3 to Wing4	3km
Wing1 to Wing2	3.5km
Wing1 to Wing3	4.5km
Wing2 to Wing3	2.5km

Number of computers

Wing 1	10
Wing 2	15
Wing 3	15
Wing 4	100

- (i) Suggest the most appropriate location to install the server? Justify your answer.
- (ii) Suggest the best wired medium and draw the cable layout to efficiently connect various locations within the office.
- iii) Which hardware device will you suggest to connect all computers within each location of the office?
- iv) Which service provider / protocol will be most helpful to conduct live interactions of experts?