

# AMRITA VIDYALAYAM

## AMRITA PRE BOARD EXAMINATION 2 - 2018 - '19

Class : XII

Marks : 70

Time : 3 hrs

### COMPUTER SCIENCE (NO. 083)

- 1.a) Find the correct identifiers out of the following, which can be used for naming variable, constants or functions in a C++ program. 2  
while, for, float, new, 2ndName, A%B, Amount2, \_Counter
- 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  

```
typedef char TEXT[80];
void main()
{
    TEXT Str[] = "Peace is supreme";
    int Index=0;
    while (Str[Index]!='\0')
        if (isupper(Str[Index]))
            Str[Index++]='#';
        else
            Str[Index++]='*';
    puts(Str);
}
```
- c) Observe the following C++ code very carefully and rewrite it after removing any / all syntactical errors with each correction underlined. 2  
Note: Assume all required header files are already being included in the program.  

```
#Define float Max=70.0;
Void main()
{
    int Speed
    char Stop='N';
    cin>>Speed;
    if Speed>Max
        Stop='Y';
    cout<<Stop<<end;
}
```
- d) Write the output of the following C++ program code. 2  
Note: Assume all the required header files are already being included in the program.  

```
#define Modify(N) N*3+10
void main()
{
    int LIST[]={10,15,12,17};
    int *P=LIST, C;
    for(C=3; C>=0; C--)
        LIST[C]=Modify(LIST[C]);
    for (C=0; C<=3; C++)
    {
        cout<<*P<<": ";
        P++;
    }
}
```
- e) Write the output of the following C++ program code. 3  
Note: Assume all required header files are already being included in the program.

```

class Calc
{
char Grade;
int Bonus;
public:
Calc() {Grade='E';Bonus=0;}
void Down(int G)
{
    Grade-=G;
}
void Up (int G)
{
    Grade+=G;
    Bonus++;
}
void Show()
{
    cout<<Grade<<"#"<<Bonus<<endl;
}
};
void main()
{
    Calc c;
    C.Down(2);
    C. Show();
    C.Up(7);
    C.Show();
    C.Down(2);
    C.Show();
}

```

- f) Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable CHANGER. 2

Note :-

- Assume all the required header files are already being included in the code.
- The function random(n) generates an integer between 0 and n – 1

```

void main()
{
randomize();
int CHANGER;
CHANGER=random(3);
char CITY[ ][25]={"DELHI","MUMBAI","KOLKATA","CHENNAI"};
for(int I=0;I<=CHANGER;I++)
{
    for(int J=0;J<=I;J++)
        cout<<CITY[J];
    cout<<endl;
}
}

```

- (i) DELHI  
DELHIMUMBAI  
DELHIMUMBAIKOLKATA
- (ii) DELHI  
DELHIMUMBAI  
DELHIMUMBAIKOLKATA

DELHIMUMBAIKOLKATACHENNAI

- (iii) MUMBAI  
MUMBAIKOLKATA  
MUMBAIKOLKATACHENNAI
- (iv) KOLKATA  
KOLKATACHENNAI

- 2.a) What is a copy constructor? Give a suitable example in C++ to illustrate with its definition within a class and a declaration of an object with the help of it. **2**
- b) Write the definition of a class PIC in C++ with following description. **4**

Private Members

```
Pno //Data member for Picture Number (an integer)
Category //Data member for Picture Category (a string)
Location //Data member for Exhibition Location (a string)
FixLocation //A member function to assign Exhibition
Location //as per category as shown in the following table
```

Category	Location
Classic	Radha
Modern	Arjun
Antique	Krishna

Public Members

```
Enter() //A function to allow user to enter values
Pno //category and call FixLocation() function
SeeAll() //A function to display all the data members
```

- c) Answer the questions (i) to (iv) based on the following. **4**

```
class ORGANISATION
{
    char Address[20];
    double budget, Income;
protected:
    void Compute();
public:
    ORGANISATION();
    void Get();
    void Show();
};
class WORKAREA : public ORGANISATION
{
    char Address[20];
    int staff;
protected:
    double pay;
    void Calculate();
public:
    WORKAREA();
    void Enter();
    void Display();
};
class SHOWROOM : private ORGANISATION
{
    char Address[20];
    float Area;
    double Sale;
public:
```

```

SHOWROOM();
void Enter!();
void Show();
};

```

(i) Name the type of inheritance illustrated in the above C++ code.

(ii) Write the names of data members, which are accessible from member functions of class SHOWROOM.

(iii) Write the names of the member functions, which are accessible from objects belonging to class WORKAREA.

(iv) Write the names of all the members, which are accessible from objects of class SHOWROOM.

d) What is the difference between automatic type conversion and type casting? Also, give a suitable C++ code to illustrate both. **2**

3.a) Write a function SKIPEACH(int H[ ][3], int C, int R) in C++ to display all alternate elements from two-dimensional array H (starting from H[0][0]). **2**

If the array is containing

```

12   45   67
33   90   76
21   43   59

```

The output will be

```

12   67   90   21   59

```

b) An array S[10][30] is stored in the memory along the column with each of the element occupying 2 bytes. Find out the memory location of S[5][10], if the element S[2][15] is stored at the location 8200. **3**

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

```

struct TEXTBOOKS
{
    char ISBN[20];
    char TITLE[80];
    TEXTBOOKS *Link;
};
class STACK
{
    TEXTBOOKS *Top;
public:
    STACK() {Top=NULL;}
    void Push();
    void Pop();
    STACK();
};

```

d) Write a function REVCOL (int P[ ][5], int N, int M) in C++ to display the content of a two dimensional array, with each column content in reverse order. **3**

Note: Array may contain any number of rows. For example, if the content of array is as follows.

```

15   12   56   45   51
13   91   92   87   63
11   23   61   46   81

```

The function should display output as

```

11   23   61   46   81
13   91   92   87   63
15   12   56   45   51

```

e) Convert the following infix expression to its equivalent Postfix expression, showing the stack

contents for each step of conversion.

2

$A * B ^ C + D$

- 4.a) Write function definition for SUCCESS() in C++ to read the content of a text file STORY.TXT, count the presence of word SUCCESS and display the number of occurrence of this word. 2

Note:-

The word SUCCESS should be an independent word

Ignore type cases (i.e. lower/upper case)

Example:

If the content of the file STORY.TXT is as follows :-

*Success shows others that we can do it. It is possible to achieve success with hard work.*

*Lot of money does not mean SUCCESS.*

The function SUCCESS() should display the following.

3

- b) Write a definition for function BUMPER() in C++ to read each object of a binary file GIFTS.DAT, find and display details of those gifts, which has remarks as "ÖNDISCOUNT". Assume that the file GIFTS.DAT is created with the help of objects of class GIFTS, which is defined below. 3

```
class GIFTS
{
    int ID;char Gift[20],Remarks[20]; float Price;
public:
    void Takeonstock()
    {
        cin>>ID;gets(Gift);gets(Remarks);cin>>Price;
    }
    void See()
    {
        cout<<ID<<" : "<<Gift<<" : "<<Price<<" : "<<Remarks<<endl;
    }
    char *GetRemarks() {return Remarks;}
};
```

- c) Find the output of the following C++ code considering that the binary file CLIENTS.DAT exists on the hard disk with records of 100 members. 1

```
class CLIENTS
{
    int Cno;char Name[20];
public :
    void In(); void Out();
};
void main()
{
    fstream CF;
    CF.open("CLIENTS.DAT",ios::binary|ios::in);
    CLIENTS C;
    CF.read((char*) &C, sizeof(C));
    CF.read((char*) &C, sizeof(C));
    CF.read((char*) &C, sizeof(C));
    int POS=CF.tellg()/sizeof(C);
    cout<<"PRESENT RECORD:"<<POS<<endl;
    CF.close () ;
}
```

- 5.a) Observe the following table carefully and write the names of the most appropriate columns, which can be considered as

2

(i) candidate keys.

(ii) primary key.

Id	Product	Qty	Price	Transaction Date
101	Plastic Folder 12"	100	3400	2014-12-14
104	Pen Stand Standard	200	4500	2015-01-31
105	Stapler Medium	250	1200	2015-02-28
109	Punching Machine Big	200	1400	2015-03-12
103	Stapler Mini	100	1500	2015-02-02

- b) Consider the following tables CARDEN and CUSTOMER and answer (A) and (B) parts of this question.

Table: CARDEN

Ccode	CarName	Make	Color	Capacity	Charges
501	A-Star	Suzuki	RED	3	14
503	Indigo	Tata	SILVER	3	12
502	Innova	Toyota	WHITE	7	15
509	SX4	Suzuki	SILVER	4	14
510	C Class	Mercedes	RED	4	35

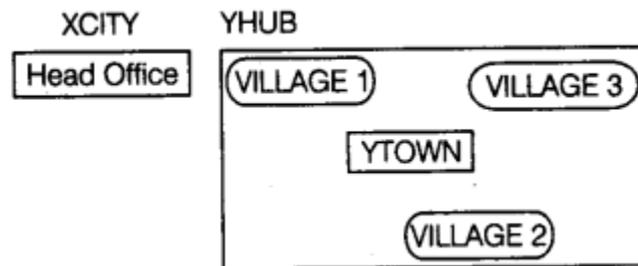
Table: CUSTOMER

Ccode	Cname	Ccode
1001	Hemant Sahu	501
1002	Raj Lal	509
1003	Mohan Shah	503
1004	Ketan Dhal	502

- (A) Write SQL commands for the following statements. 4
- (i) To display the names of all the silver colored Cars.
- (ii) To display name of car, make and capacity of cars in descending order of their seating capacity.
- (iii) To display the highest charges at which a vehicle can be hired from CARDEN.
- (iv) To display the customer name and corresponding name of the cars hired by them.
- (B) Give the output of the following SQL queries. 2
- (i) `SELECT COUNT (DISTINCT Make) FROM CARDEN;`
- (ii) `SELECT MAX(Charges) , MIN(Charges) FROM CARDEN;`
- (iii) `SELECT COUNT(*) , Make FROM CARDEN;`
- (iv) `SELECT CarName FROM CARDEN WHERE Capacity = 4;`
- 6.a) Verify the following using Boolean Laws. 2
- $X + Y' = X.Y + X.Y' + X'.Y'$
- b) Draw the Logic Circuit for the following Boolean Expression. 2
- $(U + V').W' + Z$
- c) If  $F(P, Q, R, S) = \pi(0, 2, 4, 5, 6, 7, 8, 10, 11, 12, 14)$  obtain the simplified form using K-Map. 3
- d) Derive a Canonical SOP expression for a Boolean function F, represented by the following truth table. 1

X	Y	Z	G (X, Y, Z)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

- 7.a) Illustrate the layout for connecting 5 computers in a Bus and a Star topology of Networks. **1**
- b) What is a spam mail? **1**
- c) Give the full form of the following terms. **2**  
XML, FLOSS, HTTP, FTP
- d) Write one characteristic each for 2G and 3G mobile technologies. **1**
- e) What is Worm? How is it removed? **1**
- f) Intelligent Hub India is a knowledge community aimed to uplift the standard of skills and knowledge in the society. It is planning to set-up its training centers in multiple towns and villages pan India with its head offices in the nearest cities. They have created a model of their network with a city, a town and 3 villages as follows. As a network consultant, you have to suggest the best network related solutions for their issues/problems raised in (i) to (iv), keeping in mind the distance between various locations and other given parameters. **4**



Shortest distances between various locations.

VILLAGE 1 to YTOWN	2 KM
VILLAGE 2 to YTOWN	1.5 KM
VILLAGE 3 to YTOWN	3 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	3.5 KM
CITY Head office to YHUB	30 KM

Number of Computers installed at various locations are as follows.

YTOWN	100
VILLAGE 1	10
VILLAGE 2	15
VILLAGE 3	15
CITY OFFICE	5

NOTE

In Villages, there are community centers, in which one room has been given as training center to

this organisation to install computers. The organisation has got financial support from the government and top IT companies.

- (i) Suggest the most appropriate location of the SERVER in the YHUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer.
- (ii) Suggest the best wired medium and draw the cable layout (location to location) to efficiently connect various locations within the YHUB.
- (iii) Which hardware device will you suggest to connect all the computers within each location of YHUB?
- (iv) Which service / protocol will be most helpful to conduct live interactions of Experts from Head Office and people at YHUB locations?