



ANANDALAYA
PRE BOARD EXAMINATION - 2
Class : XII

Subject : COMPUTER SCIENCE
Date : 13/01/2016

M.M : 70
Time : 3 Hours

General Instructions:

- (I) Programming language C++.
(II) All questions are compulsory.

Q-1

- (a) Name the header file to which the following belong: (i) isupper() (ii) random(). 1
(b) Illustrate the use of inline function in C++ with help of an example. 2
(c) Rewrite the following program after removing the syntactical error(s), if any. Underline each correction. 2

```
# include<iostream.h>
CLASS STUDENT
{
    int admno;
    float marks;
public:
    STUDENT() { admno=0; marks=0.0; }
    void input() { cin>>admno>>marks; }

    void output() { cout<<admno<<marks; }
} }
void main()
{
    STUDENT S;
    Input(S);
}
```

- d) Give the output of the following code-(Write steps) 2

```
struct
{
    int x , y;
} *p , sg [4] = { { 9 , 8 } , { 7 , 6 } , { 5 , 4 } , { 3 , 2 } };
p = &sg[0];
p ++;
for ( int j = 0 ; j < 4 ; j ++ , p ++ )

    cout << ( p + j ) -> x << " \t" << ( p + j ) ->y<<endl;
}
```

- e) Write a function in C++ which accepts an integer and a double value as arguments/parameters. The function should return a value of type double and it should perform sum of the following series:
 $x - x^2/3! + x^3/5! - x^4/7! + x^5/9! \dots\dots$ upto n terms 3

Q-2

- a. Define Multilevel and Multiple Inheritance in context of Object Oriented Programming. Give suitable example to illustrate the same. 2

b. class cat
{
public:
 cat(int initialAge)
 {
 itsAge=initialAge;
 }
 ~cat()
 {
 }
}

```

        int getAge()
        {
            return itsAge;
        }
        void setAge(int Age)
        {
            itsAge=Age;
        }
        void Meow()
        {
            cout<< "Meow\n";
        }
    private:
        int itsAge;
    }
void main()
{
    cat Friskey(5);
    _____ //Statement 1
    cout<< "Friskey is a cat who is";
    cout<<_____ << "years old\n"; //Statement 2
    _____ //Statement 3
    Friskey.setAge(7);
    cout<< "\n Now Friskey is";
    cout<<_____ << "years old\n"; //Statement 4
}

```

Observe the program given above carefully and fill the blanks marked as Statement 1, Statement 2, Statement 3 and Statement 4 to produce the following output:

```

Meow
Friskey is a cat who is 5 years old
Meow
Now Friskey is 7 years old

```

2

c. Define a class named Publisher in C++ with the following descriptions :

Private members

Id	long
title	40 char
author	40 char
price , stockqty	double
stockvalue	double
valcal()	A function to find price*stockqty with double as return type

Public members

- a constructor function to initialize price , stockqty and stockvalue as 0
- Enter() function to input the idnumber , title and author
- Takestock() function to increment stockqty by N(where N is passed as argument to this function) and call the function valcal() to update the stockvalue().
- sale() function to decrease the stockqty by N (where N is sale quantity passed to this function as argument) and also call the function valcal() to update the stockvalue
- outdata() function to display all the data members on the screen.

4

d. Answer the question (i) to (iv) based on the following code:

```

Class Medicines
{
    char Category[10];
    char Dateofmanufacture[10];
    char Company[20];
public:
    Medicines();

    void entermedicinedetails();
}

```

```

        void showmedicinedetails();
    };
class Capsules : public Medicines
{
protected:
    char capsulename[30];
    char volumelabel[20];
public:
    float Price;
    Capsules();
    void entercapsuledetails();
    void showcapsuledetails();
};
class Antibiotics : public Capsules
{
    int Dosageunits;
    char sideeffects[20];
    int Usewithindays;
public:
    Antibiotics();
    void enterdetails();
    void showdetails();
};

```

- i. How many bytes will be required by an object of class Medicines and an object of class Antibiotics respectively?
- ii. Write names of all the member functions accessible from the object of class Antibiotics.
- iii. Write names of all the members accessible from member functions of class Capsules.
- iv. Write names of all the data members which are accessible from objects of class Antibiotics. 4

Q-3

- a. Define function stackpush() to insert nodes and stackpop() to delete nodes, for a linklist implemented stack having the following structure for each node:

```

struct Node
{
    char name[20];
    int age;
    Node *Link;
};
class STACK
{
    Node * Top;
public:
    STACK( ) { Top=NULL;}
    void stackpush( );
    void stackpop( );
    ~STACK( );
};

```

- b. An array S[40][30] is stored in the memory along the row with each of the element occupying 4 bytes, find out the memory location for the element S[15][5], if an element s[20][10] is stored at memory location 5700. 4

- c. Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation:

TRUE,FALSE, TRUE FALSE, NOT, OR, TRUE , OR,OR,AND 2

- d. Write UDF in C++ which accepts an integer array and its size as arguments/ parameters and assign the elements into a 2 D array of integers in the following format:

If the array is 1,2,3,4,5.

The resultant 2D array is given below

1 0 0 0

1 2 0 0

1 2 3 0 0

1 2 3 4 0

1 2 3 4 5

- e. Write UDF in C++ to print the row sum and column sum of a matrix. 4

Q- 4

(a) Write a function in C++ to search for a room-number (RoomNo) given by the user in an already existing binary is called 'Hospital.Dat'. Also display complete record of the room-no searched if found otherwise display a message 'not found'.

3

```
class Hospital
{
    int Room_No;
    char Patient_N [30];
public :
    void Input() { gets (Patient_N); cin >> Room_No; }
    void Output()
    {
        cout << "Patient's Name:" << Patient_N << endl;
        cout << "Room Number:" << Room_No << endl;
    }
    int Getroom() { return Room_No; }
};
```

(b) Write a program to create a text file "TEXT.DOC". Transfer the lines that start with a vowel (not case sensitive) to the file in reverse order. (do not use strrev) to a new file "EXAM.DOC". Merge the content of both the files into a third file "FINAL.DOC", contents of "TEXT.DOC" followed by "EXAM.DOC". Also find the total number of bytes occupied by the file.

2

(c) Write a function in C++ to search for BookNo from a binary file "BOOK.DAT", assuming the binary file is contained the objects of the following class:

```
class BOOK
{
    int Bno; char Title [20];
public :
    int Rbno () { return Bno; }
    void Enter () { cin >> Bno; gets (Title); }
    void Display () { cout << Bno << Title << endl; }
};
```

2

Q-5

a. Define entity and referential integrity.

2

Write a SQL commands for (b) to (g) with the help of the table given below:

EMP

Ename	char (20)
Deptt	char (20)
Salary	number (8,2)
Desig	char (10)

- Show sum and average salary for marketing deptt.
- Check all employees have unique names.
- Find all employees whose deptt. is same as of "amit".
- Increase the salary of all employees by 10%.
- Find the deptt. that is paying max salaries to its employees.
- Display the details of all the employees having salary less than 10000.

6

Q-6

a. Simplify the Boolean expression of F using Karnaugh Maps:

$$F(a, b, c) = \Pi(1, 3, 5, 7)$$

2

b. State and verify the De Morgan's law using Algebraic method?

1

c. there are four railway tracks at a place. It is desired to design a logic circuit, which can give a signal when three or more trains pass together at any given time.

- Draw the truth table for the above problem.
- Simplify the expression using K-Map.
- Draw a Logic circuit.

4

d. Given the following truth table, write the sum-of-product form of the function F(x, y, z).

1

X	Y	Z	F
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	0
1	1	1	1

e. Represent NOT using only NOR gate(s). 1

Q-7 a) Compare circuit switching and message switching. 2

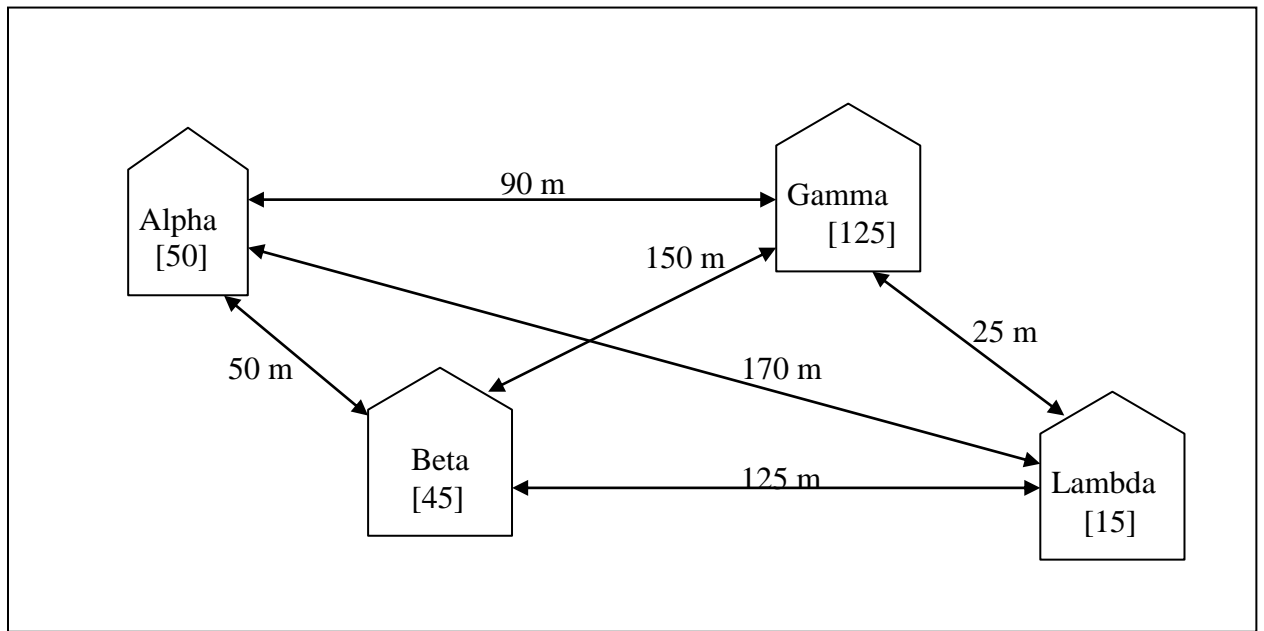
b) Expand the following : 2

- a. TCP/IP
- b. XML
- c. CDMA
- d. WLL

c) What is the utility of Cyber law? 1

d) What do you understand by the terms Gopher and Archie.

e) Knowledge supplement Organization set up its new centre at Muscat for its office and web based activities. It has four buildings as shown in the diagram below:



↔ Shows distance
 [] Shows number of computers in each building

i) Suggest a cable layout of connections between the buildings. 1

ii) Suggest the most suitable place to house the server of this organization with a suitable reason. 1

iii) Suggest the placement of the following devices with justification: 1

- Repeater
- Hub/Switch

iv) The organization is planning to link its front office situated in the city in a hilly region, where cable connection is not feasible, suggestion an economic way to connect it with reasonably high speed. 1