COMMON PRE-BOARD EXAMINATION 2017-2018

COMPUTER SCIENCE

CLASS XII

Time Allowed: 3 hours   Maximum Marks: 70

General Instructions:
  i) Programming Language: C++
  ii) All questions are compulsory.

1.   (a)   What is the benefit of using function prototype for a function? Give a suitable   2
           example to illustrate it using C++ code.

     (b)   Write the names of the header files to which the following functions belong: 1
             i) clrscr( )   ii) isalpha( )

     (c)   Rewrite the following program after removing the syntactical errors (if any).   2
           Underline each correction.
           void main( )
           { int p = 5, a[5] ; const int q = 10 ;
             a[5] = {12,14,16,18,20} ;
             a[3] = p + q ;
             p++; q-- ;
             for(i = 0; i < 5; i++)
             cout<< a[i] ;
           }

     (d)   Find the output of the following program: 3
           #include<iostream.h>
           struct MyBox { int Length, Breadth, Height ;
           };

           void Dimension(MyBox M)
           { cout<<M.Length<< "x" <<M.Breadth<< "x" ;
             cout<< M.Height << endl ;
           }

           void main( )
           { MyBox B1={20,18,7}, B2,B3 ;

```
        ++B1.Height ;
        Dimension(B1) ;
        B3 = B1 ;
        ++B3.Length ;
        B3.Breadth++ ;
        Dimension(B3)  ;
        B2 = B3 ;
        B2.Height  += 3 ;
        B2.Length-- ;
        Dimension(B2) ;
     }
```

(e)   Find the output of the following code snippet: 2

```
#include<iostream.h>
#include<ctype.h>
#include<conio.h>
#include<string.h>
void  NewText(char  str[ ], int  &pos)
{ char  *p =  str ;
  int  length = strlen(p) ;
  for( ; pos < length- 2 ;  pos  += 2 , p++)
  { *(p + pos) = toupper(*(p + pos )) ; }
  cout<< str ;
}
void  main( )
{ int  x = 0 ;
  NewText("Good Morning", x) ;
}
```

(f)   Observe the following program carefully, if the value of Num entered by the   2
       user is 8, choose the correct possible output(s) from the options from (i) to
       (iv) and justify your option.
```
#include<iostream.h>
#include<stdlib.h>
void main( )
{ randomize( ) ;
  int Num, Rndnum ;
  cin>> Num ;
  Rndnum = random(Num) + 5 ;
  for(int N = 1 ; N <= Rndnum ; N++)
  cout<< N<< " " ;
}
```

Output Options:
  (i) 1 2 3 4
  (ii) 1 2 3 4 5 6 7 8 9 10 11
  (iii)0 1 2 3 4 5 6 7
  (iv)1 2 3 4 5

2.   (a)   What is the difference between multiple inheritance and multilevel   2
             inheritance?

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

             ```
             class TV
             { char  company[15] ;
              float  price  ;
              public:
              TV(char *c, float p)  //  function 1
              { strcpy(company,c) ;
                price = p ;}

              TV( TV  &temp) ;    // function 2
             } ;
             ```

                 (i) Create an object, such that it invokes function 1.
                 (ii) Write the complete definition for function 2.

      (c)   Define a class MP in C++ with the following description: 4

             Private members:
                 a. MP_Name of type string.
                 b. Party_Name of type string.
                 c. No_of_Votes   of type integer.
                 d. Nom_Money of type float.
             Public members:
             A default constructor to initialize MP_name as NULL,Party_Name as
             "Independent" , number of vote as 1000 and nomination money as 5000.
             A destructor to destruct MP class object.
             A function INMP( ) to input data for MP.
             A function OUTMP( ) to allow user to view the content of all the data
             members.

      (d)   Answer the questions (i) to (iv) after going through the following code: 4
             ```
             class  Person
             { char  Name[30] ;
              protected:
                char Address[20] ;
              public:
                Person( ) ;
             ```

```
   void read_Person( );
   void disp_Person( );
};

class Employee : protected Person
{   int   ENo ;
  protected:
    float  Salary ;
  public:
    Employee( ) ;
    void read_Employee( ) ;
    void disp_Employee( ) ;
};

class  Student : private Person
{   int   RollNo ;
    float   Marks ;
  public:
    Student( ) ;
    void  read_Student( ) ;
    void_disp_Student( ) ;
};
```

    (i) Which type of the inheritance is shown in the above example?
    (ii) Mention the name of all members that are accessible by the member function of class Employee.
    (iii) Mention the name functions that are accessible by the object of class Student.
    (iv) How many bytes will be required by an object of class Employee?

3.   (a)   Write a function **Exchange( )** in C++ which accepts an integer array and its size as argument and exchange the value of all negatives elements with their positive equivalent.   2
Example:
If an array contains:
-2, 4, -1, 6, -7, 9, -23, 10
The function should rearrange the array as:
2, 4, 1, 6, 7, 9, 23, 10

    (b)   Write a user defined function **Product( )** to print the product of each row of a two dimensional array. The array and its size are passed as the argument to the function.   3
Example: If the two dimensional array of size 3 x 4 contains
2 5 4 7
3 6 2 2
4 2 1 3

Then the output should appear as:
Product of Row1 = 280
Product of Row2 = 72
Product of Row3 = 24

(c)   An array B[30][10] is stored in the memory along the row with each element   3
       occupying 4 bytes of storage. Find the base address and the address of the
       element B[10][4], if the location B[2][3] is stored at the address 1500.

(d)   Consider the following portion of a program, which implements a linked   4
       stack for BOOKS. Write a function POP( ) to delete a node from stack:
       struct BOOK
       { int Bno ;
         char Title[20] ;
         char Author[30] ;
         BOOK *Next ;
       } ;

       class Stack
       { BOOK   * top ;
         public:
           Stack( )
           { top = NULL ;}
         ~Stack( ) ;
           void PUSH( ) ;
           void POP( ) ;
       }

(e)   Evaluate the following postfix expression using stack showing stack status in   2
       each stage:
       6, 10, 5, + , * , 18, 3, / , -

4.   (a)   Observe the following program segment given below carefully and fill in the   1
       blanks marked as Statement1 and Statement2 using seekg( ) and tellg( )
       functions for performing the required task:

       #include<fstream.h>
       class Flight
       { int FNO ;
         char FName[20] ;
        public:
         int CountRec( ) ; // Function to count total number of records
       } ;

```
int  Flight : :  CountRec( )
{
   Flight   Obj ;
   Fstream   File ;
   File.open("Flight.dat", ios : : in | ios : : binary) ;
   _____  // Statement 1

   int   bytes  = _____// Statement 2
   int  count = bytes /sizeof(Obj) ;
   File.close( ) ;
   return(count) ;
}
```

(b) Write a function in C++ to count the word "are" as an independent word present in a text file STORY.TXT
Example:
If the file contains: Those are wild animals. They are carnivores.
Then the output should be:
    The count of word "are" = 2

2

(c) Write a function in C++ to update the name of a record in a binary file "STUDENT.DAT" ,assuming the binary file is containing the objects of the following class. The Rno and new name are read during execution of the program.

3

```
class STUD
{ int    Rno ;
   char   Name[20] ;
public:
  void  Enter( ) { cin>>Rno ; gets(Name) ; }
  void  Display( ) { cout<< Rno <<Name << endl ;}
  int  Getroll( ) { return Rno ;}
} ;
```

5. (a) What do you understand by cardinality and attribute of a relation?

2

(b) Consider the following tables FACULTY and COURSES. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

6

TABLE: FACULTY

| F_ID	FNAME	LNAME	HIRE_DATE	SALARY
102	Amit	Mishra	12-10-1998	12000
103	Nitin	Vyas	24-12-1994	8000
104	Rakshit	Sony	18-05-2001	14000
105	Rashmi	Malhotra	11-09-2004	11000
106	Sulekha	Srivastava	05-06-2006	10000
107	Niranjan	Kumar	20-08-1996	16000

TABLE: COURSES

C_ID	F_ID	CNAME	FEES
C21	102	Grid Computing	40000
C22	106	System Designs	16000
C23	104	Computer Security	8000
C24	106	Human Biology	15000
C25	102	Computer Networks	20000
C26	105	Visual Basic	6000
C27	107	Dream Weaver	4000

(i) To display details of those faculties whose date of joining is before 31-12-2001.

(ii) To display the details of courses whose fees is in the range of 15000 to 50000(both values included).

(iii) To increase the fees of Dream Weaver course by 500.

(iv) To display F_ID,FNAME,CNAME of those faculties who charged more than 15000 as fees.

(v) SELECT COUNT(DISTINCT F_ID) FROM COURSES ;

(vi) SELECT MIN(SALARY) FROM FACULTY F, COURSES C WHERE C.F_ID = F.F_ID ;

(vii) SELECT F_ID, SUM(FEES) FROM COURSES GROUP BY F_ID HAVING COUNT(*) > 1 ;

(viii) SELECT FNAME, LNAME FROM FACULTY WHERE LNAME LIKE "M%" ;

6.   (a)   State and prove Complementary Law.   2

(b)   Write the equivalent Boolean Expression for the following logic circuit.   2
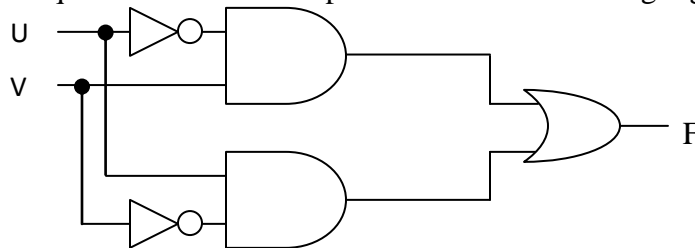
(c)   Derive a Canonical POS expression for a Boolean function G, represented by the following truth table.   1

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

(d) Reduce the following Boolean Expression to its simplest form using K-Map. 3
$F(P, Q, R,S) = \sum (0 ,1 ,2 ,3, 4, 5, 8, 9, 10, 11, 15)$

7. (a) What do you understand by the term cookies? 1

(b) Expand the following terminologies: 1
    (i) SIM   (ii) CDMA

(c) Categorize the following under Client side and Server side script category? 1

    (i) Java Script   (ii) ASP   (iii) VB Script (iv) JSP

(d) Subash wants to purchase a Book online and he has placed the order for that 1
book using an e-commerce website. Now, he is going to pay the amount for
that book online using his Mobile, then he needs which of the following to
complete the online transaction:-

1. A bank account,

2. Mobile phone which is attached to above bank account,

3. The mobile banking app of the above bank installed on that mobile,

4. Login credentials(UID & Pwd) provided by the bank,

5. Or all of above.

(e) Differentiate between PAN and LAN types of network. 1

(f) What do you mean by a virus and a worm in context with computers? 1

(g) Knowledge Supplement Organization has set up its new centre at Mangalore
for its office and web based activities. The company compound has 4
buildings a shown in the diagram below:
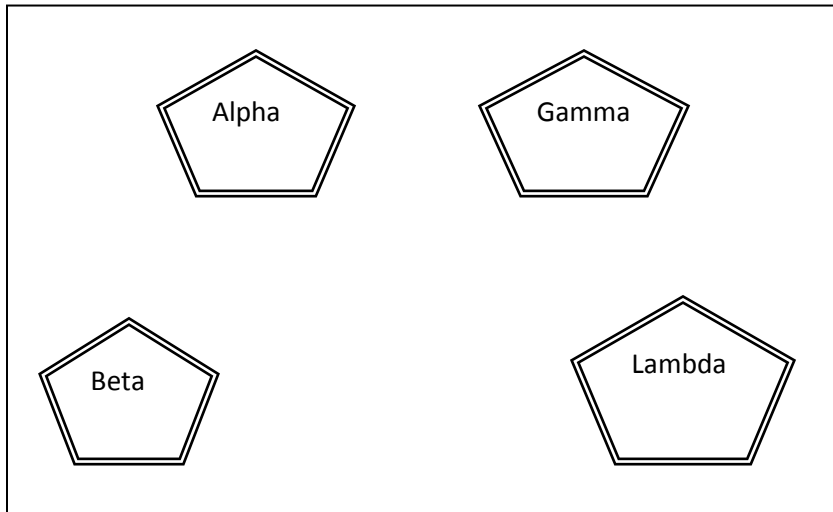
Centre to centre distances between various buildings is as follows:

Alpha to Beta	50 m
Beta to Gamma	150 m
Gamma to Lambda	25 m
Alpha to Lambda	170 m
Beta to Lambda	125 m
Alpha to Gamma	90 m

Number of computers in each building is as follows:

Alpha Building	25
Beta Building	50
Gamma Building	150
Lambda Building	10

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

(ii) Suggest the most suitable place(i.e building) to house the SERVER of this organization with a suitable reason.   1

(iii) Suggest the placement of the following devices with justification:
   (a) Repeater   (b) Switch   1

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