

3 sets

INTERNATIONAL INDIAN SCHOOL-DAMMAM
I TERM EXAMINATION -2012

CLASS : XII
SUBJECT : COMPUTER SC.

TIME : 3 HOURS
MM : 70

StudentBounty.com

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

SET A

1.a) What is the difference between type casting and automatic type conversion? Explain it with suitable example. (2)

b) Name the header files that shall be needed for the successfully execution of following code (1)

```
#include<iostream.h>
void main( )
{
    char Word[]="Exam2012";
    cout<<"Number : "<< fabs(-10)<< setw(5)<< Word; }
```

c) Rewrite the following program after removing all the syntactical errors (if any), underlining each correction. (2)

```
# include<iostroem.h>
typedef char[20] String;
void main( )
{ string C= "India";
  cout<<"Country:" C<<endl; }
```

d) Rewrite the following program after removing all the syntactical errors (if any), underlining each correction. (2)

```
#include<iostream.h>
class Item
{ long lld , Qty;
public: Item( ){ lld= 0 ; qty = 0; }
    void Purchase{ cin>>lld >>Qty;}
    void sale ( )
    {
        cout<<setw(5) << lld<<Qty;
        cout<< -- Qty;
    }
    Item l;
}
void main( )
{
    l.Purchase( );
    l.sale( );
}
```

e) Give the *output* of the following program (Assuming that all required header files are included in the program) (3)

```
#define i 5
class TEMP
{ int a;
public:
TEMP( )
{a = 2 , b = 10; }
void INTEMP( int x )
{ a++; x += a;
b = x+10; }
void OUTTEMP( int x)
{ cout<<a*b*x<<"$"<<(b-3)*x<<endl; } };
void main()
{ TEMP ob[5];
for(int x=1;x<5;x++)
ob[x].INTEMP(x);
for(x=1;x<5;x++)
ob[x].OUTTEMP(x);}
```

f) Find the output of the following code(Assume all header files present)

(2)

```
void Decode(char Text[ ] )
{ for ( int c = 0 ; Text[c] ; c++ )
{
char CH = ( Text[c]>= 'a' && Text[c] <='z')? Text[c]-32:Text[c];
if(CH<='M' && CH >='H')
Text[c]='#';
else if( CH == 'A' | | CH == 'E' | | CH == 'U')
Text[c] = tolower ( CH);
else if( CH >= '0' && CH <= '9')
Text[c] = '$';
else
Text[c] = toupper(CH);
}
}
void main( )
{ char SMS[ ] ="US2InDIA";
Decode(SMS);
cout<< SMS<<endl; }
```

g) Go through the following c++ code, find out which option(s) i) to iv) will be expected output(s) from the program ?. Also write the *highest value and lowest value* which can be assigned to variable K

(2)

```
#include<iostream.h>
#include<stdlib.h>
void main( )
{
randomize( );
int G,K,H=5;
G=random(H)+30;
K=random(H-1)+G;
for(int i=35;i>G;i--)
cout<<i<<'$';
cout<<i; }
```

- i) 35\$34\$33\$32\$31\$30\$ ii) 35\$34\$33\$32\$31
 iii) 30\$31\$32\$33\$34\$35\$36 iv) 35\$34\$33\$32\$31\$30

2a) How does a member function differ from ordinary function ? Define with example. (2)
 b) Can a sub class get access privilege for a private member of the super class? Define with example. (2)

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

```
class Train
{ private:
  char Pname[30], TicketNo[20];
  float Fare;
public:
  void EnDetails( )           //function 1
  { gets(Pname); gets(TicketNo); cin>>Fare;
  }
  void Details( )             //function 2
  { cout<<Pname<<endl<<TicketNo<<endl<<Fare<<endl; }
  Train(char name[ ], char tno[ ], float N); //function 3
  Train(Train &T);             // function 4
};
```

- i) In OOP, which concept is illustrated by function 3 and Function 4 together ?
 ii) When function 4 is invoked? Also Define this function.

d) Define a class TAXPAYER in C++ with following description : (4)

Private members :

- Name of taxpayer
- PanNo
- Taxabincm (Taxable income)
- TotTax
- A function CompTax() to calculate tax according to the following slab:

Taxable Income	Tax%
Up to 60000	0
Any amount above 60000 but up to 150000	5
Any amount above 150000 but up to 500000	10
Any amount above 500000	15

Public members :

- A parameterized constructor to initialize all the members
- A function INTAX() to enter data for the tax payer and call function CompTax() to assign TotTax.
- A function OUTAX() to allow user to view the content of all the data members.

3. a) Answer the questions (i) to (iv) based on the following : (4)

```
class Student
{ private :
  char Rollno[20], Sname[30];
protected :
  float marks;
```

```

public:
    Student( );
    void ENROL( );
    void SHOW( );
};
class Graduate: Student
{ char Fname[30];
protected:
    unsigned int age;
public:
    Graduate( );
    void GENROL( );
    void GSHOW( );
};
class Pgraduate: public Graduate
{
    char Mname[25];
    signed int year;
public:
    Pgraduate( );
    void PGENROL( );
    void PGSHOW( );
};
void main( )
{
    Graduate Goj;
}

```

- i) Mention the member names that are accessible by an object of Pgraduate class.
- ii) Name the data members which can't be accessed by Goj
- iii) Name the data members that can be accessed by the functions of Pgraduate class.
- iv) How many bytes will be occupied by Goj ?

b) Answer the questions i) to iv) based on the above code (4)

- i) What is the order of destructor and constructor call in function main()
- ii) Name the members of class Student inherited by Pgraduate class
- iii) Define the inheritance shown in the given code ?
- iv) Name the methods that can be accessed by GENROL(), if Graduate is derived in protected visible mode

c) Suppose a class defined as follows : (2)

```

class Vehicle
{ private : int model ;
        int wheels;
public : Vehicle(Vehicle & V);           // function 1
        void input( ) { cin>>model>>wheels;} // function 2
        int year_model ( ) { return model ; } //function 3
        int num_of_wheels( ) { return wheels ;} // function 4
};

```

- i) Write complete definition of function 1
 ii) Write statement to print the model and the number of wheels of a vehicle named as Veh

d) Define a class Departmental with the following specification :

(4)

private data members

Prod_name string (45 charactes) [Product name]
 Listprice long
 Dis_Price long [Discount Price]
 Net long [Net Price]
 Dis_type char(F or N) [Discount type]
 Cal_price() – To calculate Discount price and Net price ,The store gives a 10% discount on every product it sells. However at the time of festival season the store gives 7% festival discount after 10% regular discount. The discount type can be checked by tracking the discount type, where 'F' means festival and 'N' means Non- festival .

public members

- Constructor to initialize the string elements with "NULL", numeric elements with 0 and character elements with 'N'
- Accept() - Ask the store manager to enter Product name, list Price and discount type . The function will invoke Cal_price() to calculate Discount Price and Net Price .
- ShowBill() - To generate the bill to the customer with all the details of his/her purchase along with the bill amount including discount price and net price.

e) Write a function **TRANSFER()** , that takes a double dimension array DALL[4][4] .

as parameter and prepare a one dimensional array SALL[16] that will have all the elements of DALL if they are stored in row major form. for example for the following array

(2)

```

1  2  3  4
5  6  7  8
9  10 11 12
13 14 15 16

```

The resultant array should be 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

f) Write a function "sum_from_to" that takes two integer arguments , call them "first" and "last" and returns as its value the sum of all integers between first and last inclusive

(2)

4

a) What is the function of select and project operations ?. Explain with example. (2)

b) Consider the following table **GAMES** and **PLAYER**. Write SQL commands for the statements

(i) to (viii) (8)

and give outputs for SQL queries (ix to (xii). (2)

Table : GAMES

GCODE	GAMENAME	NUMBER	PRZMONEY	SCHDATE
101	Chess	5	25000	23-Jan- 2010
102	Badminton	3	38000	12- Nov- 2008
103	Carom	6	18000	18- Mar- 2010
105	Table Tennis	3	30000	23- Jan -2010
108	Basketball	5	40000	29- Apr- 2009

Table : PLAYER

PCODE	NAME	GCODE
1	Rakesh Srivastava	101
2	Nilesh Mishra	102
3	Vandana	108
4	Ravi Jindal	105

- (i) Display the details of those games which are having prize money less than 30000 but organized before 10-2-2009.
- (ii) Display the name of PLAYERS in the same order as they appear for which prize money is less than 20000 .
- (iii) Show additional Increase on prize money by 2 percent for those games which name does not contain a as second character.
- (iv) Add a new tuple in the table player essentially with game as chess
- (v) Display the name of players who are playing chess only
- (vi) Erase all the records except of table tennis.
- (vii) Display player name along with their code if they are playing carom
- (viii) Display a report having name of game followed by gamecode for each date and place the results in the reverse order of prize of money
- (ix) SELECT NAME from PLAYER where GCODE < 108 AND GCODE >=101 order by NAME
- (x) SELECT MIN(SCHDATE), MAX(PRZMONEY) FROM GAMES ;
- (xi) SELECT AVG(PRZMONEY) FROM GAMES WHERE NUMBER NOT IN(3,6)
- (xii) SELECT COUNT(DISTINCT NUMBER) FROM GAMES where schdate<"23-jan-2010";

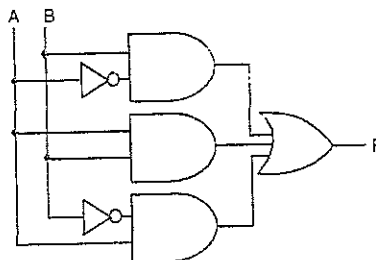
- 5 a) State and algebraically prove Distributive law in Boolean algebra. (2)
- b) Simplify the following (1)

$$(A + B)'(C + D + E)' + (A + B)'$$
- c) Verify De Morgan's first theorem algebraically (2)
- d) Construct $F = w.(x.y)'$ by using any one of the universal gate (2)
- e) Convert the following function to CSOP form (1)

$$F(x,y,z) = \Pi(1,3)$$
- f) Write simplified sop expression for the following using K map (2)

$$F(a,b,c,d) = \Sigma(0,3,4,5,7,8,9,11,12,13,15)$$
- g) What is closure property ? (1)
- h) Prove the following algebraically (2)

$$(x' + y + z)(x + y' + z)(x' + y + z')(x + y' + z') = (x + y')(y + z')(x' + y)$$
- i) Find F' when $F = A'B + B'(C + D')$ (1)
- j) Write the equivalent Boolean Expression F for the following circuit diagram (2)
 - i) All the inputs are high
 - ii) One of the input is high



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

SET B

- 1.a) How are arrays passed in a function? Explain it with suitable example. (2)
b) Name the header files that shall be needed for the successfully execution of following code #include<iostream.h> (1)

```
void main( )  
{  
    char TEXT[]="SomeThing";  
    cout<<"Remaining SMS Chars : "<<160-strlen(TEXT);  
    cout<<"\n"<<toupper(TEXT); }
```

- c) Rewrite the following program after removing all the syntactical errors (if any), underlining each correction. (2)

```
#include<iostream.h>  
typedef char[40] string;  
void main( )  
{ string S[ ]="Australia";  
  L=strlen(S);  
  cout<<"String "<<S<<" has<<L<<"Characters"<<endl; }
```

- d) Rewrite the following program after removing all the syntactical errors (if any), underlining each correction. (2)

```
#include<iostream.h>  
class Item  
{ Long lld , Qty;  
  void Purchase { cin>>lld >>Qty;}  
public : void sale( )  
  {  
    cout<< lld<<Qty;  
    cout<< -- Qty;  
  }  
};  
void main( )  
{ l.Purchase( );  
  l.Sale( );  
}
```

- e) Give the *output* of the following program (Assuming that all required header files are included in the program) (3)

```

#define i 5
class TEMP
{ int a;
public:
TEMP( )
{ a=10, b=2; }
void INTEMP( int x )
{ a++;
x * = a;
b= x+10; }
void OUTTEMP( int x )
{ cout<<a*b*x<<"$"<<(b-3)*x<<endl; } };
void main( )
{ TEMP ob[5];
for(int x=1;x<5;x++)
ob[x].INTEMP( x);
for(x=1;x<5;x++)
ob[x].OUTTEMP(x);}

```

f) Find the output of the following code(Assume all header files present)

(2)

```

void Decode(char Text[ ] )
{ for ( int c = 0 ; Text[c] ; c++ )
{ char CH = ( Text[c]>= 'a' && Text[c] <='z')? Text[c]-32:Text[c];
if(CH<='M' && CH >='H')
Text[c]='#';
else if ( CH == 'A' || CH == 'E' || CH == 'U')
Text[c] = tolower ( CH);
else if ( CH >= '0' && CH <= '9')
Text[c] = '$';
else
Text[c] = toupper(CH);
}
}
void main( )
{ char SMS[ ] ="inDia2Us";
Decode(SMS);
cout<< SMS<<endl; }

```

g) Go through the following c++ code, find out which option(s) i) to iv) will be expected output(s) from the program ?.Also write the *highest value* and *lowest value* which can be assigned to variable K (2)

```

#include<iostream.h>
#include<stdlib.h>
void main( )
{
randomize( );
int G,K,H=5;
G=random(H)+30;
K=random(H-2)+G;
for(int i=35;i>G;i--)
cout<<i<<'$';
cout<<i; }

```


- i) 35\$34\$33\$32\$31 ii) 35\$34\$33\$32\$31\$30\$
 iii) 35\$34\$33\$32\$31\$30 iv) 30\$31\$32\$33\$34\$35\$36

- 2a) How does a class enforce data hiding and abstraction ? Define with example. (1)
 b) Describe how is an object of a class that contains objects of other classes are created ? (2)
 c) Answer the questions (i) and (ii) after going through the following class : (2)

```
class BUS
{ private:
  char Pname[30], TicketNo[20];
  float Fare;
public:
  void EnDetails( )           //function 1
  { gets(Pname); gets(TicketNo); cin>>Fare;
  }
  void Details( )             //function 2
  { cout<<Pname<<endl<<TicketNo<<endl<<Fare<<endl; }
  BUS(char name[ ], char tno[ ], float N);    //function 3
  BUS(BUS &F);                               // function 4
};
```

- i) In OOP, what is function 3 referred to as? Also define this function.
 ii) Define function 4 and write about its purpose?

- d) Define a class **Travel** in C++ with the description given below : (4)

Private Members :

T_Code	of type char[15]
No_of_Adults	of type integer
No_of_Children	of type integer
Distance	of type integer
TotalFare	of type float

Public Members :

- A *Constructor* to assign initial values as follows :

T_Code with the word "NULL"
 No_of_Adults as 0
 No_of_Children as 0
 Distance as 0
 TotalFare as 0

- A function *AssignFare()* which calculates and assigns the value of the data member TotalFare as follows :

For each Adult:

Fare (Rs) For Distance (Km)	
200	<500
300	<1000 & >=500
500	>=1000

For each Child the above Fare will be 50% of the Fare mentioned in the above table.

- A function *EnterTravel()* to input the values of the data members T_Code, No_of_Adults, No_of_Children and Distance; and invoke the AssignFare().
 ➤ A function *ShowTravel()*, which displays the content of all the data members.

3. a) Answer the questions (i) to (iv) based on the following

```
class Student
{ private :
    char Rollno[20], Sname[30];
protected :
    double marks;

public:
    Student( );
    void ENROL( );
    void SHOW( );
};
class Graduate
{ char Fname[30];
protected:
    unsigned int age;
public:
    Graduate( );
    void GENROL( );
    void GSHOW( );
};
class Pgraduate: Student , public Graduate
{
    char Mname[25];
    signed int year;
public:
    Pgraduate( );
    void PGENROL( );
    void PGSHOW( );
};
void main( )
{ Graduate Goj; Pgraduate PGoj; }
```

- i) Mention the member names that are inaccessible by PGoj.
 - ii) Name the data members which can be accessed by the Goj,
 - iii) Name the data members that can be accessed by the functions of Pgraduate class.
 - iv) How many bytes will be occupied by Goj ?
- b) Answer the questions i) to iv) based on the above code (4)
- i) Which class constructor will be called last ?
 - ii) Name the members which can be accessed by PGoj if Pgraduate is derived as privately from Student and Graduate.
 - iii) What is meant by inheritance shown in the given code ?
 - iv) Name the methods that can be accessed by PGENROL().
- c) Write a function Interchange() that accepts an array (ARR[]) and its size (SIZE) as parameters to modify the content of the array in such a way that the elements which are multiples of 10 swap the value present in the very next position in the array. (2)

For example if the content of the array is 90,56,45,20,34,54
The content of the array should become 56,90,45,34,20,54

d) Write a function **TRANSFERP(int ALL[], int N)**, to transfer all the prime numbers from one dimensional array ALL[] to another one dimensional array PRIME[]. The results in PRIME[] must be displayed on screen.

e) Suppose a class is defined as follows :

(2)

```
class Vehicle
{ private : int Model ;
        int Wheels;
    public : Vehicle( int M , Int W );           // function 1
        void Input( ) { cin>>Model>>Wheels;}    // function 2
        int Year_Model ( ) { return Model ; }     //function 3
        int Num_Of_Wheels( ) { return Wheels ; } // function 4
};
```

- Write complete definition of function 1
- Write statement to print the number of wheels followed by the model of a vehicle object named as VEH

f) Define a class Store with the following specification :

(4)

private data members

```
Itemname  string (45 charactes) [ Item name]
Itemprice  long
Disprice   long [ Discount Price]
Nprice     long [Net Price ]
Distype    char(f or n) [ Discount type]
```

Calprice() – To calculate Discount price and Net price ,The store gives a 8% discount on every product it sells. However at the time of festival season the store gives 5% festival discount after 8% regular discount. The discount type can be checked by tracking the discount type, where 'f' means festival and 'n' means Non- festival .

public members

- Constructor to initialize the string elements with "NIL", numeric elements with 0 and character elements with 'n'
- EnDetails() - Ask the store manager to enter Itemname, Itemprice and discount type .The function will invoke Calprice() to calculate Discount Price and Net Price .
- DispBill() - To generate the bill to the customer with all the details of his/her purchase along with the bill amount including discount price and net price.

4

a) What does union operation do ? Define with example .

(2)

b) Consider the following table **GAMES** and **PLAYER**. Write SQL commands for the statements

(i) to (viii)

(8)

and give outputs for SQL queries (ix to (xii).

(2)

Table : GAMES

GCODE	GAMENAME	NUMBER	PRZMONEY	SCHDATE
101	Chess	5	25000	23 -Jan- 2010
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105	Table Tennis	3	30000	23 -Jan- 2010
108	Basketball	5	40000	29 -Apr- 2009

Table : PLAYER

PCODE	NAME	GCODE
1	Rakesh Srivastava	101
2	Nilesh Mishra	102
3	Vandana	108
4	Ravi Jindal	105

- (i) Display the details of those games which are having prize money not less than 20000 but organized after 10-5-2008.
- (ii) Display the name of PLAYERS in the reverse order as they appear for which prize money is in the range 15000 and 25000 (both inclusive)
- (iii) Show further reduce on prize money by 5 percent for those games which name contains a as second character and n as last character.
- (iv) Add a new tuple in the table player essentially with game as basketball
- (v) Display the playercode who are playing badminton
- (vi) Erase all the records of table tennis.
- (vii) Display playercode followed by their name having prizemoney 30000
- (viii) Display a report having gamecode followed by gamename for each date and place the results in the increasing order of prize of money
- (ix) SELECT NAME from PLAYER where GCODE <=108 AND GCODE >101 order by NAME
- (x) SELECT MAX(SCHDATE), MIN(PRZMONEY) FROM GAMES ;
- (xi) SELECT AVG(PRZMONEY) FROM GAMES WHERE NUMBER IN(3,5)
- (xii) SELECT COUNT(NUMBER) FROM GAMES;

5

- a) Verify De Morgan's second theorem algebraically (2)
- b) Simplify the following (1)

$$(AB)'(C+D+E) + (AB)'$$
- c) State and algebraically verify Distributive law in Boolean algebra. (2)
- d) Construct $F = w + (x+y)'$ by using any one of the universal gate (2)
- e) Prove the following algebraically (2)

$$(x'+y+z)(x+y'+z)(x'+y+z')(x+y+z') = (x+y')(y+z')(x'+y)$$
- f) Write simplified POS expression for the following using K Map (2)

$$F(w,x,y,z) = \prod (0,1,2,4,5,7,8,9,10,11,14)$$
- g) What is the usage of duality principle in Boolean algebra? (1)
- h) Convert the following function to CPOS form (1)

$$F(x,y,z) = \Sigma(1,3,6,7)$$
- i) Find F when $F' = w'x + x'(y+z')$ (1)
- j) Write the equivalent Boolean Expression F for the following circuit diagram (2)
 - i) All the inputs are high
 - ii) One of the input is low

