

SAMPLE PAPER – PRE BOARD EXAMINATION 2012-2013

CLASS 12
COMPUTER SCIENCE

Time Allotted: 3 Hours

Max. Marks: 70

General Instructions:

- Read the questions carefully.
- All the questions are compulsory.
- Marks are indicated against each question.
- Maintain proper sequence while answering.
- Do not attempt the answers more than once. In case it is necessary, do not forget to cancel the previous attempt (s).

1. a) What is function prototype? Give a C++ statement that makes use of it. 2
b) Determine the header file required for the following program: 1

```
void main( )  
{  
    char s[25]="Message";  
   strupr(s);  
    cout<<setw(25)<<s;  
}
```

- c) Remove the syntax errors from the following program and rewrite the corrected program. Do underline each correction: 2

```
class abc  
{  
    int a;  
    char b[25];  
    void getdata( );  
    public:  
    void dispdata( );  
    protected:  
    abc( );  
    void setdata( );  
};
```

```
class xyz protected abc
```

```
{  
    int x[5];  
    protected:  
    void putxyz( );  
    public:  
    xyz( );  
    float y;  
    void getxyz( );  
    void setxyz( );  
};
```

```
void main( )  
{  
    abc x;  
    dispdata( );  
    xyz y;  
    y.putxyz( );  
}
```

- d) Determine the output of the following program. Do assume all the required header files have been opened: 2

```
int a = 2;
void process(int &a,int b=2)
{
    a+=::a+b;
    ::a+=a+b;
    b+=::a+a;
}
void main( )
{
    int a=5,b=7;
    process(a);
    cout<<endl<<a<<"*"<<b<<"$"<<::a;
    process(::a,b);
    cout<<endl<<a<<"*"<<b<<"$"<<::a;
}
```

- e) Choose the correct output options, given after the question. Give suitable justification for your answer. Do assume all the required header files have been opened: 2

```
void main( )
{
    int a[ ] = {14,4,6,1,2,3,8,10,12,5,7,9};
    randomize( );
    for (int i=1;i<4;i++)
    {
        int r=random(5)+i;
        cout<<a[r]<<"#";
    }
}
```

- i. 4#3#8#
- ii. 10#12#14#
- iii. 2#8#10#
- iv. 6#6#2#

- f) Determine the output of the following program. Do assume all the required header files have been opened: 2

```
void pass(int *a, int n)
{
    for (int i=0;i<n;i++)
    {
        *a+=i*i;
        a++;
    }
}
void main( )
{
    int p[ ] = {5,2,7,9,4,3,6,8};
    pass(p,8);
    for (int i=0;i<8;i++)
    {
        cout<<p[i]<<" ";
        if (i%4==0)
            cout<<endl;
    }
}
```

```
}
```

2. a) What is constructor overloading? Give an example in the form of C++ instructions. 2
b) Declare a class with the following specifications: 4

Private members:

r integer
c integer
a integer 2 dimensional array (10 rows, 5 columns)
calsum() Calculates the sum of matrices, both being sent as arguments

Public members:

Inmat() Accept values of r,c, a and makes a call to calsum() function
Outmat() Print values of all the data members

- c) Consider the following class declaration and answer the questions that follow: 2

```
class Month
{
    int number;
    char name[25];
    public:
    Month(long,char[ ]);//fun1
    Month( )//fun2
    Month(SMS&)//fun3
    ~Month( )//fun4
};
```

- i. What is the process called when fun1, fun2 and fun3 are put together
ii. Write the definition for the function fun3, in the form of C++ instructions.

- d) Consider the following class declaration and answer the questions that follow:

```
class Student
{
    char name[25];
    long roll;
    void getstd( );
    protected:
    int setstd( );
    public:
    int marks[4];
    void putstud( );
};
```

```
class Sports
{
    char game[30];
    double success;
    void getsports( );
    public:
    void putsports( );
    protected:
    void setsports();
};
```

```
class Allrounder : protected Sports, Student
```

```
{
    int *contest;
    protected:
    char events[10][15];
    char *getall( );
```

```

void putall( );
public:
void setall(char *, int);
};

```

- i. Determine the size of an object of class Allrounder
- ii. Determine the type of inheritance followed in the above piece of code.
- iii. Determine the member functions accessible to the objects of class Allrounder
- iv. Determine the data members accessible to the class Allrounder

3. a) Evaluate the following postfix expression: 2
5,4,3,+,2,7,*,-,/

b) Consider an array M[10][6] where each element occupies 3 bytes of memory and is stored along the row. If the base address is at 2500 and find the address of the element M[7][3]. 3

c) Write a function swap() that accepts a single dimensional array and its size as arguments, and swaps odd elements with the corresponding even elements. The function also prints the contents of the resultant array. Consider the following example for a better perspective: 3
Original Array: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Resultant Array: 3, 2, 5, 4, 7, 6, 9, 8, 11, 10

d) Write a function rowmax() that accepts a two dimensional array B, with a size of 3X7, and prints the row wise maximum elements from matrix. Consider the following example for a better perspective: 3
Original matrix:

2	5	6	1	5	2	7
6	1	8	5	6	3	8
2	4	9	1	4	5	3

Required output:

7 8 9

e) Write a function insvalue() that inserts the name of a city into dynamically allocated stack. Consider the following self referential structure for the purpose: 4
struct city

```

{
    char name[25];
    city *p;
};

```

4. a) Consider the following C++ function that modifies the content of the binary file BINARY.DAT and fill up the gaps: 1

```

class doctor
{
    int years;
    char name[25];
public:
    void objadd( );
    void objmod( );
    void objview( );
    char *getname( )
    {
        return (name);
    }
};
void objmod(char nm[ ])
{

```

```

doctor s;
fstream f("binary.dat",ios::binary|ios::in|ios::out);

while (f.read((char*)&s,sizeof(s)))
{
    if (strcmp(s.getname( ),nm)==0)
    {
        //positions the write pointer at the appropriate location
        _____
        //writes the data into the file
        _____
        break;
    }
}
f.close();
}

```

- b) Write a function filecopy() that copies the contents of the file STORY.TXT into a specified file, which is accepted as an argument in the function. 2
- c) Consider the following class declaration: 3

```

class machine
{
    int modelno;
    char company[25];
    char mfgdate[20];
public:
    void getdata( );//input modelno, company, mfgdate
    void putdata( );//print modelno, company, mfgdate
    char *returnmfgdate( );//returns manufacturing date
};

```

Write a function search() that searches a record from the binary file MACHINES.DAT according to given manufacturing date, taken as an argument into the function.

5. a) Identify primary key, alternate key and candidate key, out of any table taken as an example. Include 4 records in the table considered as an example. 2
- b) Consider the following relations PLAYER and COACH:

RELATION: BOOK						
BOOKNO	TITLE	FACNO	SUBJECT	DTPURCHASE	PRICE	STATUS
PB125	Physical being	45	PHE	28-aug-2011	175	Returned
TM125	Time machine	14	Physics	14-mar-2009	1250	Issued
CP102	C++ projects	13	Computer	21-mar-2010	725	Issued
SE225	Software engineering	42	Computer	19-jul-2010	850	Returned
AAP47	Animals and pets	7	Science	15-jul-1999	195	Issued
E256	Essays	25	English	19-jun-1990	250	Issued
LE102	Light energy	12	Science	26-feb-2001	195	Issued

RELATION: FACULTY			
FACULTYNO	FACNAME	LATEDAYS	FINE
7	Shruti Sethi	15	
25	Sanjay Sen	10	
13	Venus Tomar	25	
14	Sonika Kulshreshtha	18	
12	Shamit Reddy	12	

- Write SQL statements for the following: 6
- Display SUM and AVERAGE of price for each type of status
 - Display a list of subjects without any repetition
 - Display TITLE and SUBJECT for all books whose price is more than 300
 - Calculate FINE column as $12 * \text{LATEDAYS}$ for all faculties
 - Add a column PHONE in FACULTY relation, that stores the contact number of the faculty members
 - Display student's name and faculty's name whose latedays is at least 15

- Write the output for the following SQL statement: 2
- SELECT MIN(PRICE) FROM BOOK WHERE DTPURCHASE BETWEEN '15-AUG-2000' AND '15-AUG-2012';
 - SELECT COUNT(STATUS) FROM BOOK;

6. a) State the Absorption Laws and prove any one of them, algebraically. 2
 b) Derive the canonical POS expression from the following: 1
 $F = A.B' + A'.C + B.C$
 c) Draw the logic circuit diagram for the Boolean expression, using NOR gates only: 2
 $F = (X'+Y).X.(Y'+Z')$
 d) Derive the reduced Boolean expression for the following: 3
 $F(W,X,YZ) = \pi(0,2,3,4,8,9,10,11,14,15)$
7. a) What is FLOSS? 1
 b) What is topology? 1
 c) Give advantages of optical fibre over coaxial cable. 2
 e) Define the following terms: 2
 i. http
 ii. CDMA

- g) Printel India Ltd. is a educational organization who has set up its new center at Nainital for its varied web activities. It has 4 buildings in its campus, Computer Block, Library Block, Admin Block and Hostel Block. The details are given below: 4

Center to center distances between various blocks	
Computer Block to Library Block	150 m
Computer to Admin Block	10 m
Computer to Hostel Block	75 m
Library Block to Admin Block	70 m
Library Block to Hostel Block	105 m
Admin to Hostel Block	40 m

Number of computers	
Computer Block	135
Library Block	25
Admin Block	75
Hostel Block	15

- 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.
- Suggest the most suitable place (block) to house the server of this organization with a suitable reason
- Suggest a cable layout of connections between the blocks
- Suggest the placement of the following devices with justification:
 - Repeater
 - Hub/Switch

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