

BRCM PUBLIC SCHOOL, BAHAL**Exam:** 1ST Pre Board Exam 09**Subject:** Computer Science**Class:** XII**Dated:** JAN 2009**Time:** 3:00 Hr.**Max. Marks:** 70**SET - 1**

- 1.(a) Illustrate the use of “Self-Referential structures” with the help of an example. 2
- (b) Name the header file to which the following built in function belong to : 2
strcpy() ceil() initgraph() setw()
- (c) Read the following program after removing all the syntax error(s), if any 2
Underline each correction.
void main()
{ first =20, sec = 10;
 Jumpto(first; sec);
 Jumpto(sec);
}
void Jumpto(int x, int y=30)
{ x=x+y;
 cout<<x>>y;
}
- (d) Find the output of the following program: 2
#include<iostream.h>
void main()
{ long Number = 9583291;
 int First=0, Second=0,R;
 do
 { R=Number%10;
 if (R%3==0)
 First+=R;
 else
 Second+=R;
 Number /=10;
 } while (Number>0);
 cout<<First-Second;
}
- (e) Give the output of the following program : 3
#include<iostream.h>
int &max(int &x, int &y)
{ if (x<y)
 return y;
 else
 return x;
}
void main()
{ int A=30, B=40;
 max(A,B)=8;
 cout<<"A = "<<A<<"B ="<<B<<endl;

```

max(B,A)=5;
cout<<"A = "<<A<<"B ="<<B<<endl;
max(A,B)=3;
cout<<"A = "<<A<<"B ="<<B<<endl;
}

```

- (f) Write a C++ function SUMFUN() having two parameters X (of type double) and n (of type integer) with a result type as double to find the sum of the series given below and also write the main function which can call the function and display the result? 3

$$X + \frac{X^2}{3!} + \frac{X^3}{5!} + \dots + \frac{X^n}{(2n-1)!}$$

- 2.(a) What is a pointer? How will you define a pointer to a floating point number and a pointer to a character? 2

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

```

class Exam
{
    int Marks;
    char Subject[20];
public:
    Exam(int M, char sub[])           //Constructor 1
    Exam(Exam & t);                 //Constructor 2
};

```

- i. Write complete definition for Constructor 1 and Constructor 2
- ii. Create an object, such that it invokes Constructor 1 and Constructor 2.

- (c) Define a class EBILL with following information : 4

Private members are :

CustomerNo Integer
Name Character of size 20
Cunits Integer (Consumed units)
Bill Float (Bill charged)

Public members are :

Input() A function to enter the data CustomerNo, Name, Cunits
Compute() A function calculate Bill as per the condition given below.

| <u>Unit Consumed</u> | <u>Per unit charge</u> |
|----------------------|------------------------|
| First 100 units | 1.5 Rs |
| Next 200 units | 2.5 Rs |
| Next 300 units | 3.5 Rs |
| Beyond 600 units | 5.0 Rs |

Output() A function to display the CustomerNo, Name, Cunits and Bill.

- (d) Consider the following and answer the question given below: 4

```

Class University
{
    int NOC; // number of colleges
}

```

```

protected:
    char Uname[20]; // University Name
public :
    University( )
    Char State[25];
    void EnterData( );
    void DisplayData( );
};
class college : private University
{ int NOD;          // number of departments
  char Cname[25];  // college name
protected :
    void Affiliation( );
public:
    college();
    void Enrol(int, int);
    void Show( );
};
class Department : public college
{ char Dname[25]; // Departments
  int Nof;        // no of faculty members
public :
    Department( );
    void Display( );
    void Input( );
};
void main( )
{ Department dept; }

```

- (i) Which class's constructor will be called first at the time of program execution?
- (ii) How many bytes does the dept require given in main() function?
- (iii) Name the member function(s), which are inherited by the object dept.
- (iv) Name the data member(s), which are accessible from the object(s) of class college.

- 3.(a) Assume an array **St** containing elements of structures Student is required to be arranged in descending order of Marks. Write a C++ function to arrange the same with the help of bubble sort. The array and its size is required to be passed as parameters to the function. Definition of structure Student is as follows: 3
- ```

struct student
{ int Rollno;
 char name[20];
 float marks;
};

```
- (b) An array X[15][30] is stored in the memory with each element requiring 8 bytes of storage. If the base address of X is 5300, find out memory locations of X[8][12] and X[12][2], if the content is stored along the row. 3
- (c) Use a stack to evaluate the following postfix expression and show the content of the stack after execution of each operation. Don't write any code. Assume as if you are 2

using push and pop member functions of the stack

$AB - CD + E * +$  (where  $A=5, B=3, C=5, D=4$  and  $E=2$ )

- (d) Write a user-define function in C++ to display those elements of a two dimensional array  $T[4][4]$  which are divisible by 5. Assume that content of the array is already present and the function prototype is as follows. 2  
 Void Showfive(int  $T[4][4]$ );
- (e) Consider the following portion of a program, which implements passengers Queue of train. Write the definition of function Insert( ) and Delete( ) (whose prototype is shown below), with required information given below. 4  
 struct NODE  
 { long ticketno;  
 char Pname[20]; // passenger Name  
 NODE \*next;  
 };  
 class queueoftrain  
 { NODE \*rear, \*front;  
 public :  
 Queueoftrain( ) { rear = NULL; front=NULL;}  
 void Insert();  
 void Delete();  
 ~Queueoftrain();  
 };  
 4.(a) (a) void main( ) 2  
 { char ch[]='BAHAL';  
 ofstream fileout(" data.dat"; ios::app);  
 fileout<<ch;  
 int p = fileout.tellg( );  
 cout<<p; }
- What is the output, if the file content before the execution of the program is the string? "BRCM PUBLIC SCHOOL-" (Note that "" are not part of the file)
- (b) Write a user define function in C++ to read the content from a text file STORY.TXT, count and display the number of lowercase alphabets present in it. 2
- (c) Given a binary file PHONE.DAT, containing records of the following structure type 3  
 class phonlist  
 { char name[20];  
 char address[30];  
 char areacode[5];  
 char phoneno[15];  
 public:  
 void register( );  
 void show( );  
 int checkcode(char acode[])  
 { return strcmp(areacode, acode);  
 }  
 };  
 };  
 };

Write a function TRANSFER( ) in c++, that would copy all those records which are having areacode as “DEL” from PHONE.DAT to DELPHONE.DAT.

- 5.(a) What is primary key and candidate key? 2
- (b) Study the following table DOCTOR and SALARY and write SQL command for the give questions: 6

Table : DOCTOR

| ID  | NAME     | DEPT       | SEX | EXPERIENCE |
|-----|----------|------------|-----|------------|
| 101 | John     | ENT        | M   | 12         |
| 104 | Smith    | ORTHOPEdic | M   | 5          |
| 107 | George   | CARDIOLOGY | M   | 10         |
| 114 | Lara     | SKIN       | F   | 3          |
| 109 | K George | MEDICINE   | F   | 9          |
| 105 | Johnson  | ORHTOPEdic | M   | 10         |
| 117 | Lucy     | ENT        | F   | 3          |
| 111 | Bill     | MEDICINE   | F   | 12         |
| 130 | Morhpy   | ORTHOPEdic | M   | 15         |

Table : SALARY

| ID  | BASIC | ALLOWANCE | CONSULTATION |
|-----|-------|-----------|--------------|
| 101 | 12000 | 1000      | 300          |
| 104 | 23000 | 2300      | 500          |
| 107 | 32000 | 4000      | 500          |
| 114 | 12000 | 5200      | 100          |
| 109 | 42000 | 1400      | 200          |
| 105 | 18900 | 1690      | 300          |
| 130 | 21700 | 2600      | 300          |

- (1) Display Name of all doctors who are in “MEDICINE” having more than 10 years experience from the table DOCTOR.
- (2) Display a Report with Dept, total salary paid to the departments. Where salary = Basic + Allowance.
- (3) Write the command to add one more column SALARY of NUMBER(9) in the SALARY table.
- (4) Calculate Salary as BASIC + ALLOWANCE and store in the Field SALARY of Salary table.
- (5) Give the Output of the following:
  - a. SELECT count(\*) from DOCTOR where SEX = 'F';
  - b. SELECT NAME, DEPT, BASIC FROM DOCTOR, SALARY where DEPT='ENT' AND DOCTOR.ID = SALARY.ID;
  - c. SELECT AVG(BASIC), AVG(ALLOWANCE) FROM DOCTOR, SALARY where DEPT='ORTHOPEdic' AND DOCTOR.ID = SALARY.ID;
  - d. SELECT SEX, COUNT(\*) FROM DOCTOR GROUP BY SEX;

- 6.(a) State De Morgan’s Laws. Verify one of the De Morgan’s Laws using a truth table 2
- (b) Write the dual and complement of the Boolean expression  $(B' + C) \cdot A$  1

- (c) Obtain a simplified form for a Boolean expression  $F(U,V,W,Z) = \Sigma(0,2,3,4,7,9,10,13,14,15)$  using Karnaugh Map. 3
- (d) Represent the Boolean expression  $(X + Y') \cdot Z$  with the help of NAND gates only. 1
- (e) Write the Product of Sum form of the function  $H(U,V,W)$ . Truth table representation of H is as follows: 1

| U | V | W | H |
|---|---|---|---|
| 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 |

- 7.(a) What is the purpose of using repeater in context of networking? 1
- (b) Differentiate between Internet and Intranet? 1
- (c) Explain the function of Modem and Switch? 1
- (d) What is the difference between Crackers and Hackers and Crackers? 1
- (e) BRCM PUBLIC SCHOOL in BAHAL is setting up the network between its different wings. There are 4 wings named as SENIOR(S), JUNIOR(J), ADMIN(A) and HOSTEL(H). Distance between various wings are given below:

|                  |      |
|------------------|------|
| Wing A to Wing S | 100m |
| Wing A to Wing J | 200m |
| Wing A to Wing H | 400m |
| Wing S to Wing J | 300m |
| Wing S to Wing H | 100m |
| Wing J to Wing H | 450m |

#### Number of Computers

|        |     |
|--------|-----|
| Wing A | 10  |
| Wing S | 200 |
| Wing J | 100 |
| Wing H | 50  |

- (i) Suggest a suitable Topology for networking the computer of all wings. 1
- (ii) Name the wing where the Server is to be installed. Justify your answer. 1
- (iii) Suggest the placement of Hub/Switch in the network. 1
- (iv) Mention an economic technology to provide internet accessibility to all wings. 1