SAMPLE PAPER - SET
MARKING SCHEME
COMPUTER SCIENCE [CODE-083]
CLASS - XII

Max Time : 3 hours | **Max Marks : 70**

1. (a) Write the prototype of a function named Percent, which takes an integer as value parameter and return a float type value. The parameter should have a default value 10. **(2)**

(b) Write the names of header files, which are **NOT** necessary to run the following program: **(1)**

```
#include <iostream.h>
#include <stdio.h>
#include <string.h>
#include <math.h>
void main()
{
    char STR[80];
    gets(STR);
    puts(strrev(STR));
}
```

(c) Tarunaj has just started working as programmer in the JAGAT WORLD SOFTWARE company. In the company, he has got his first assignment to develop a small C++ module to find the biggest number out of a given set of numbers stored in a one dimensional array. Somehow he has committed a few logical mistakes while writing this code and so he is not getting the desired result from the code. Find out the mistakes and correct this C++ code so that it provides the desired result (do not add any new statement in the code). Underline each correction made: **(2)**

```
int BIGFIND(int ARR[],int Size)
{
   int BIG=ARR[1];              //Statement 1
   for (int C=2;C<Size;C++)     //Statement 2
      if (ARR[C]<BIG)           //Statement 3
         ARR[C]=BIG;            //Statement 4
   return BIG;                  //Statement 5
}
```

(d) Find output of the following program segment: **(2)**

```
int A[][3] = {{1,2,3}, {5,6,7}};
for (int i = 1; i<2; i++)
   for (int j = 0; j<3; j++)
      cout<<A[i][j]<<"*\n";
```

(e) Find output of the following program segment: **(3)**

```
int a = 3;
void demo(int x, int y, int &z)
{ a += x+y;
  z = a+y;
  y += x;
  cout<<x<<'*'<<y<<'*'<<z<<endl;
}
void main()
```

```
    { int a = 2, b = 5;
      demo(::a,a,b);
      demo(::a,a,b);
    }
```

	(f) Write a function in C++ to accept two integers as parameters and returns the greater of these numbers.	(2)
2.	(a) What do you understand by Data Encapsulation and Data Hiding? Also, give a suitable C++ code to illustrate both.	(2)
	(b) What is constructor overloading? Give an example to illustrate the same.	(2)

	(c) **Define a class HandSet in C++ with following description:**
	
	   Private members:
	    Make- of type string
	    Model- of type string
	    Price- of type long int
	    Rating- of type char
	   Public Members:
	    Function Read_Data to read an object of HandSet type.
	    Function Display() to display the details of an object of HandSet type.
	    Function RetPrice() to return the value of Price of an object of HandSet type.
		(4)

	(d) Consider the following class *counter*:	(4)

```
class counter
{  protected :
   unsigned int count;
 public :
   counter()
      { count = 0; }

   void inc_count()
     { count++; }

   int get_count()
     { return count; }
};
```

Write code in C++ to publically derive another class new_counter from class counter. Class new_counter should have the following additional function members in the public visibility mode:
 (i)   A parameterized constructor to initialize the value of count to the value of parameter.
 (ii)   dec_count() to decrease the value of data member count by 1.
 (iii) Reset() to set the value of data member count to 0.

3.	(a) Write a function TRANSFER(int A[], int B[], int Size) in C++ to copy the elements of array A into array B in such a way that all the negative elements of A appear in the beginning of B, followed by all the positive elements, followed by all the zeroes maintaining their respective orders in array A. For example:
	   If the contents of array A are:
	     7, -23, 3, 0, -8,-3,4, 0
	   The contents of array B should be
	     -23 , -8, -3, 7, 3, 4, 0
		(3)

	(b) Each element of the array A[8][6] is stored using 4 bytes of memory. If the element A[2][4] is stored at location 936, find the address of A[5][1]. Assume that the array	(3)

	is stored column-wise.	

	(c) Write a function in C++ to perform Insert operation in a circular Queue containing Player's information (represented with the help of an array of structure PLAYER).
	
	``cpp
	struct PLAYER
	{
	    long PID; //Player ID
	    char Pname[20]; //Player Name
	};
	``
		(4)

	(d) Write a function **TRANSFORM(int A[4][3])** in C++ to swap the elements of the first column with the corresponding elements of last column of array A.	(2)
	(e) Convert the expression (A-5)*6+(10/B)/2 to corresponding postfix expression. Also show the status of operator stack after each step.	(2)

4.	(a) A binary file "Students.dat" contains data of 10 students where each student's data is an object of the following class:
	``cpp
	class Student
	{
	        int Rno;char Name[20];
	    public:
	        void EnterData() {cin>>Rno; cin.getline(Name,20);
	        void ShowData() {cout<<Rno<<" - "<<Name<<endl;}
	};
	``
	
	With reference to this information, write output of the following program segment:
	
	``cpp
	ifstream File; Student S;
	File.open("STUDENTS.DAT",ios::binary|ios::in);
	File.seekg(0, ios::end);
	Cout<<File.tellg();
	``
		(1)

	(b) Write a function in C++ to count the number of lines starting with a digit in a text file "DIARY.TXT".	(2)

	(c) Given a binary file "STUDENT.DAT", containing records of the following class Student type:
	``cpp
	class student
	{ char S_admno[10]; //Admission no. of student
	  char S_Name[20]; //Name of student
	  int Percentage; //Marks percentage of student
	   public:
	  void EnterData()
	  { gets(S_admno); gets(S_Name); cin>>Percentage;
	  }
	
	  void DisplayData()
	  { cout<<setw(12)<<S_admno;
	    cout<<setw(32)<<S_Name;
	    cout<<setw(3)<<Percentage<<endl;
	  }
	  int Ret_Per() {return Percentage;}
	};
	``
	Write a function in C++ that would read contents of the file "STUDENT.DAT" and display the details of those students whose percentage is above 75.
		(3)

5.	(a) Observe the following Table and answer the parts (i) and (ii) accordingly	(2)

Table: MEMBER

Mno	Name	Qty	PurchaseDate
101	Pen	102	12-12-2011

102	Pencil	201	21-02-2012
102	Eraser	90	09-08-2010
109	Sharpener	90	31-08-2012
113	Clips	900	08-08-2011

(i) In the above table, can we take Mno as Primary Key? (Answer as [YES/NO] only). Justify your answer with a valid reason.

(ii) What is the degree and the cardinality of the above table?

Consider the following tables SUBJECT and TEACHER and answer (b), (c), (d) and (e) parts of this question:

Table: **SUBJECT**

Code	Title	Marks_Theory	Marks_Prac
301	English	100	0
041	Maths	100	0
083	Computer Sc.	70	30
042	Physics	70	30
043	Chemistry	70	30

Table: **TEACHER**

TCode	Name	Sub_Code
1	P. Jain	301
2	R. Nagpal	301
3	Supatra	041
4	Shabnam	083
5	Rashika	042
6	Vidushi	041
7	Yash	043

(b) Write SQL commands for the flowing statements: (4)

    (i)   To display the names of all the subjects for which practical marks are 0.

    (ii)   To display the total number of teachers in each subject separately.

    (iii)   To display the names of all the teachers in the ascending order of the Sub_Code.

    (iv)   To display each subject's details along with Total_Marks in each subject from the table SUBJECT. (Total_Marks = Marks_Theory + Marks_Practical).

(c) Write SQL statement to display eache teacher's name along with his/her respective subject name from the tables TEACHER and SUBJECT. (2)

(d) Give the output of the following SQL queries: (1)

```
(i)    SELECT DISTINCT(Marks_Theory) from SUBJECT;
(ii)   SELECT TCode, Name from Teacher where Sub_Code like '0%';
```

(e) Identify primary keys of the tables SUBJECT and TEACHER. (1)

6. (a) State the dual of the absorption law X+X.Y = X and prove it algebraically. (2)

   (b) Draw the logic diagram for the Boolean expression X.(Y'+Z) using basic logic gates. (2)

   (c) Write the SOP form of the Boolean function F(P,Q,R) = Σ(0,2,3,5). (1)

   (d) Find the simplified expression for the following Boolean function using Karnaugh's map: F(A, B, C, D) = Σ(0,1,2,4,5,6,8,9,10) (3)

7. (a) To provide telemedicine facility in a hilly state, a computer network is to be setup to connect hospitals in 6 small villages (V1, V2, . . . , V6) to the base hospital (H) in the state capital. This is shown in the following diagram.
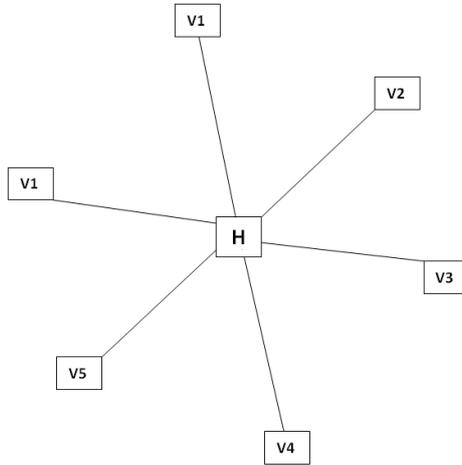
No village is more than 20km away from the state capital.

Imagine yourself as a computer consultant for this project and answer the following questions with justification:

(i)	Out of the following what kind of link should be provided to setup this network: (i) Microwave link, (ii) Radio Link, (iii) Wired link?	(2)
(ii)	What kind of network will be formed: LAN, MAN, or WAN?	(1)
(iii)	Many times doctors at village hospital will have to consult senior doctors at the base hospital. For this purpose, how should they contact them: using email, SMS, telephone, or video conference?	(1)
(b) Out of SMTP and POP3 which protocol is used to receive emails?		(1)
(c) What are cookies in the context of computer networks?		(1)
(d) Rajeshwari is trying for on-line subscription to a magazine. For this she has filled in a form on the magazine's web site. When she clicks submit button she gets a message that she has left e-mail field empty and she must fill it. For such checking which type of script is generally executed – client-side script or server-side script?		(1)
(e) Mention any one difference between freeware and free software.		(1)