COMPUTER SCIENCE (Theory) - Class XII
Sample Question Paper

TIME : 3:00 Hrs   **MM : 70**

1.

(a) Illustrate the use of #define in C++ to define a macro.   **2**

(b) Name the header file to which following belong: **1**

  (i) isalnum()   ii) floor()

(c) Rewrite the following program after removing the syntactical errors (if any).Underline each correction.   **2**

```cpp
#include<iostream.h>
struct Pixels
{
        int Color, Style ;
}
void ShowPoint(Pixels P)
{
        cout<<P.Color,P.Style<<endl;
}
void main()
{
        Pixels Point1 = (5,3);
        ShowPoint(Point 1);
        Pixels Point2 = Point1
        Color.Point1+=2;
        ShowPoint(Point2);
}
```

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

```cpp
#include<iostream.h>
int a=10;
        void main()
        {
                void demo(int &,int,int*);
                int a=20,b=5;
                demo(::a,a,&b);
                        cout<<::a<<a<<b<<endl;
        }
        void demo(int &x,int y,int *z)
        {
                a+=x;
                y*=a;
                *z=a+y;
                        cout<<x<<y<<*z<<endl;
        }
```

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

```cpp
# 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)-1);
}
cout<<str;
}
void main( )
{
clrscr( );
NewText("Good Morning", 0) ;
}
```

(f Observe the following program RANDNUM.CPP carefully. If the value of VAL entered by the user is 10, choose the correct possible output(s) from the options from i) to iv) and justify your option.   **2**

```cpp
//program RANDNUM.CPP
#include<iostream.h>
#include<stdlib.h>
#include<time.h>
void main()
{
        randomize();
        int VAL, Rnd; int n=1;
        cin>>VAL;
        Rnd=8 + random(VAL) * 1;
        while(n<=Rnd)
        {
                cout<<n<< "\t";
                n++;
        }
}
```

output options:

i) 1 2 3 4 5 6 7 8 9 10 11 12 13

ii) 0 1 2 3

iii) 1 2 3 4 5

iv) 1 2 3 4 5 6 7 8

2.

(a) What effect does inheritance have on the working of constructors and destructor?   **2**

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

```cpp
class Match
{
    int Time;
```

```
public:
        Match()                                        //Function 1
            {
Time=0;
cout<<"Match commences"<<end1;
}
void Details()                                         //Function 2
            {
cout<<"Inter Section Basketball Match"<<end1;
}

        Match(int Duration)                            //Function 3

{

Time=Duration;
cout<<"Another Match begins now"<<end1;
}
Match(Match &M)                        //Function 4
            {
Time=M.Duration;
cout<<"Like Previous Match "<<end1;
}

};
```

i) Which category of constructor - Function 4 belongs to and what is the purpose of using it?
ii) Write statements that would call the member Functions 1 and 3

(c) Define a class Movie in C++ with the description given below: **4**

Private Members:

Name_of_movie	of type character array(string)
Date_of_release	of type character array(string)
Name_of_director	of type character array(string)
Star	of type int
Total_print_release	of type int

Public Members:

A constructor to assign initial values as follows:

Name_of_movie	NULL
Date_of_release	1/1/2007
Name_of_director	NULL
Star	2
Total_print_release	100

A function calculate_star() which caculates and assigns the value of data member Star as follows:

Total Print Release	Star
>= 1000	5
< 1000 & >=500	4
< 500 & >=300	3
< 300 & >=100	2
< 100	1

A function EnterMovie() to input the values of the data members Name_of_movie, Date_of_release, Name_of_director and Total_print_release
A function ShowMovie() which displays the contents of all the data members for a movie.

(d) Answer the questions (i) to (iv) based on the following: **4**

```
class Book
{
int year_publication;
char title[25];
float price;
public:
Book( );
void input_data( );
void output_data( );
};
class Tape
{
char comp_name[20];

protected:

char comp_addr[35];
public:
Tape( );
void read_data( );
void show_data( );
};
class Publication : private Book , public Tape
{
int no_copies;
public:
Publication( );
void Pub_Entry( );
void Pub_Detail( );
};
```

(i) Write the names of data members which are accessible from objects belonging to class Publication.
(ii) Write the names of all the member functions which are accessible from objects belonging to class Tape.
(iii) Write in which order the constructors will be invoked when an object of class Publication is created .
(iv) How many bytes will be required by an object belonging to class Publication?

3. (a) Assume an array A containing elements of structure Accountant is required to be arranged in descending order of salary. Write a C++ program to arrange the same with the help of selection sort. The array and its size is required to be passed as parameters to the functions. Definition of structure Account is as under: **3**
```
struct Account
{
int Accno;
```

char AName[25];
};
(b) An array A[13][14] is stored in the memory along the column with each element
occupying 4 bytes. Find out the Base address and address of the element A[3][7] if the element
A[4][4] is stored at the address 1300. **4**
(c) Write a function to insert and delete a set of integer values in a circular queue and display
them. **3**
(d) Write a function in C++ which will accept a 2 D Array of integer and return the sum of all the
elements divisible by 5 that lie on the even row number. **2**
(e Find the post fix expression from the given infix expression:
   (A+B-(C*D)+F*G*H+M) **2**
4. **(a)** Observe the program segment given below carefully, and answer the question that
follows: **1**

```
class PracFile
{
intPracno;
char PracName[20];
int TimeTaken;
int Marks;
public:
// function to enter PracFile details
void EnterPrac( );
// function to display PracFile details
void ShowPrac( ):
// function to return TimeTaken
int RTime() {return TimeTaken;}
// function to assign Marks
void Assignmarks (int M)
{ Marks = M;}
};
void AllocateMarks( )
{ fstream File;
File.open("MARKS.DAT",ios::binary|ios::in|ios::out);
PracFile P;
int Record = 0;
while (File.read(( char*) &P, sizeof(P)))
{
if(P.RTime()>50)
P.Assignmarks(0)
else
P.Assignmarks(10)
_____ //statement 1
_____ //statement 2
Record + + ;
}
File.close();
}
```

If the function AllocateMarks () is supposed to Allocate Marks for the records in the file
MARKS.DAT based on their value of the member TimeTaken. Write C++ statements for the

statement 1 and **statement 2,** where, **statement 1** is required to position the file write pointer to
an appropriate place in the file and **statement 2** is to perform the write operation with the
modified record.
(b) Write a function to count and display the length of vowel words from a text file matter.txt. **2**
(c) Given a binary file SCHOOL.DAT, containing records of the following structure type. **3**

```
struct School
{
char Schoolname [20];
char teachernames [10] [30];
};
```

Write a function in C++ that would read contents from the file SCHOOL.DAT and creates a file
named CBSE.DAT update the School name and copying only those records from
SCHOOL.DAT whose school name is "GNPS".
5 (a) Differentiate between primary key and alternate key. ? **2**
(b) Consider the following tables SCHOOL and ADMIN. Write SQL commands for the
statements (1) to (4) and give outputs for SQL queries (5) to (8). **6**

Table: SCHOOL

CODE	GENDER	DESIGNATION	BASIC	PERKS
1001	MALE	VICE PRINCIPAL	25000	5000
1009	FEMALE	COORDINATOR	22000	4000
1203	FEMALE	COORDINATOR	20500	3000
1045	MALE	HOD	18000	2000
1123	MALE	SENIOR TEACHER	15000	1000
1167	MALE	SENIOR TEACHER	13500	1000
1215	MALE	HOD	17000	2000

Table: ADMIN

| CODE	TEACHERNAME	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	RAVI SHANKAR	ENGLISH	12/03/2000	24	10
1009	PRIYA RAI	PHYSICS	03/09/1998	26	12
1203	LISA ANAND	ENGLISH	09/04/2000	27	5
1045	YASHRAJ	MATHS	24/08/2000	24	15
1123	GANAN	PHYSICS	16/07/1999	28	3
1167	HARISH B	CHEMISTRY	19/10/1999	27	5
1215	UMESH	PHYSICS	11/05/1998	22	16

1.To display TEACHERNAME, PERIODS of all teachers whose periods less than 25 and name
   start with either R or U.
2.Display the names, subject and total salary of all male teachers where salary is the sum of
   Basic and perks.

3.To display TEACHERNAME, CODE and DESIGNATION from tables SCHOOL and
 ADMIN for female teacher.
4.To display CODE, TEACHERNAME and SUBJECT of all teachers who have joined the
 school after 01/01/1999.
5.SELECT SUM(SALARY), DESIGNATION FROM ADMIN GROUP BY DESIGNATION;
6.SELECT TEACHERNAME, GENDER FROM SCHOOL, ADMIN WHERE DESIGNATION
= 'COORDINATOR' AND SCHOOL.CODE=ADMIN.CODE
7.SELECT DESIGNATION, COUNT (*) FROM ADMIN GROUP BY DESIGNATION
HAVING COUNT (*) <3;
8.SELECT COUNT (DISTINCT SUBJECT) FROM SCHOOL;

6(a) State and Verify distributive law. **2**
(b) F (a, b , c, d) = ∏ (**0, 1, 2, 5, 8, 10, 11, 13, 14, 15**) using Karnaugh Map. **3**
(c) Draw the circuit diagram for F = AB'C + C'B using NAND – to – NAND logic only. **1**

(d) Convert the following Boolean expression into its equivalent Canonical *Sum of Product
 form (SOP)* : **(X+Y+Z) (X+Y+Z') (X'+Y+Z) (X'+Y'+Z')**
7(a) what are *firewalls*? **1**
(b) Expand the following terminology – i) DHTML   ii) W3C **1**
(C) What are the advantages of optical fibres? **1**
(d) Explain open source software? **2**
(e) Differentiate between *Telnet* & *FTP*? **1**
(f) Laxmi Marketing Ltd. has four branches in Rajasthan at Udaipur, Kota, Jodhpur and Ajmer.
Laxmi Marketing Ltd. wants to establish the networking between all the four offices.
A rough layout of the same is as follows: **4**

Udaipur
Office

Jodhpur
Office

Ajmer
Office
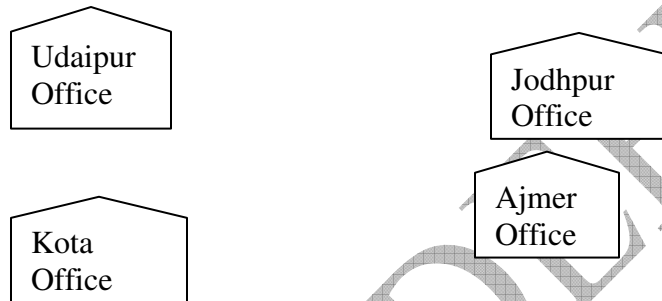
Kota
Office

Approximate distances between these offices as per network survey team are as follows:

Place From	Place To	Distance
Udaipur	Jodhpur	30 m
Jodhpur	Kota	40 m
Kota	Ajmer	25 m
Udaipur	Ajmer	150 m
Jodhpur	Ajmer	105 m
Udaipur	Kota	60 m

In continuation of the above, the company experts have planned to install the following number
of computers in each of their offices:

Udaipur	40
Jodhpur	80
Kota	200
Ajmer	60

  i). Suggest cable layout(s) for connecting the offices.
  ii). In each of the office the management wants that each LAN segments gets a dedicated
 bandwidth i.e., bandwidth must not be shared. How can this be achieved?
  iii). Where would you suggest the placement of server?
  iv). The company wants to link its head office in Udaipur to its office in London.
  1. Which type of transmission medium is appropriate for such a link?
  2. What type of network would this connection result into?