SAMPLE PAPER-2015
Class-XII
Subject :Computer Science

Time allowed : 3 hrs. **Maximum Marks : 70**

General Instruction

1. Please check this question paper contains 09 printed pages.
2. Code number given on the right side of question paper should be written on The title page of the answer – book by the candidate
3. Please check that this question paper contains 7 questions.
4. Please write down serial number of the question before attempting it.
5. All questions are compulsory.
6. Programming language : C++

1. (a) What is the abstract data type and data hiding concept ?Give real life example. **2**

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

(i) itoa () (ii) floor()

(c) Rewrite the following program after removing the syntactical error(s) if any, underline each correction. **2**

```
#include <iostream.h>
void main()
{
int i = 99, a;
        float u = 10.0;
cin(a);
int b = sqrt(a);
while a <= j
{
        a += 10;
        u = *b;
        b = sqrt(a);
}
}
```

(d) Find the output of the program. **3**

```
#include <iostream.h>
#include <string.h>
#include <ctype.h>
void convert (char *s, int n = 2)
{
        int i = n;

        while(i < strlen(s))
        {
                s[i] = '-';
                i = i + n;
```

```
    }
    i = 0;
    while(s[i] != '\0')
    {
        if(s[i] > 'A' && s[i] < 'P')
            s[i] = tolower(s[i]);
        else if(s[i] > 'a' && s[i] < 'p')
        {
            if(i % 3 == 0)
                s[i] = tolower(s[i-1]);
            else
                s[i] = tolower(s[i]);
        }
        i++;
    }
}
void main()
{
    char str[] = "MiCroSoFT";
    funnystr(str,3);
    cout<<str;
}
```

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

(i)

```
void PACK(char *str)
{ char ch='A';
int L,M,N;
for(L=0;L<str[L]!='\0';L++);
 for(M=0;M<=L;M++)
 if(str[M]=='-')
    { for(N=M;N<=L;N++)
        str[N]=str[N+1];
        M--; }
  else
        if(isdigit(str[M]))
          str[M]=ch++;
}
void main( )
{ char STD[ ]="The-STD-code--is-0542";
PACK(STD);
cout<<STD<<endl;
getch();
}
```

2

(f) Observe the following program and find out, which option or options out of (i) to (iv) will not be expected output(s) from the program? What will be the minimum and maximum value assigned to the variable Sequence. **2**

```
#include<iostream.h>
#include<stdlib.h>
void main( )
```

```
{
    int sequence, select[4] = {25, 90, 30, 45};
    randomize( );
    for ( int c= 0; c < 4 ; c++)
    {
        sequence = random( 4 - c);
        cout<< select[sequence] << "@";
    }
}
```

(i) 45@90@30@25@ (ii) 90@25@90@25@

(iii) 30@30@25@25@ (iv) 30@30@90@25@

2. (a) Reusability of classes is one of the major properties of OOP. How is it implemented in C++? **2**

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

```
class Seminar
{
int Time;
public:
Seminar() //Function 1
{ Time=30;cout<<"Seminar starts now"<<endl;}
void Lecture() //Function 2
{ cout<<"Lectures in the seminar on"<<endl;
}
Seminar(int Duration) //Function 3
{ Time=Duration;cout<<"Seminar starts now"<<endl; }
~Seminar()  //Function 4
{ cout<<"Vote of thanks"<<endl;}
};
```

i) In Object Oriented Programming, what is Function 4 referred as and when does it get invoked/called?

ii) In Object Oriented Programming, which concept is illustrated by Function 1 and Function 3 together? Write an example illustrating the calls for these functions.

(c) Define a class **Society** with the following specifications. **4**

Data members :
Private Members :

society_name char (30)

house_no integer

no_of_members integer

flat char(10)

income float

Member Functions:
Public members:

A constructer to assign initial values of society_name as “Mahavir Nagar”, flat as “A Type”, house_no as 56, no_of_members as 6, income as 50000.
input( ) – to read data members.
alloc_flat( ) – To allocate flat according to income
income >=500000 - Flat “ A Type”
income >=250000 and income <500000 - Flat “B Type”
income <250000 - Flat “ C Type”
show( ) – to display all details.

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

```
class CEO
{    double Turnover;
 protected:
     int Noofcomp;
 public:
CEO();
void INPUT(int);
void OUTPUT();
};
class Director : public CEO
{  int Noofemp;
public:
Director ();
void Indata();
void Outdata();
protected:
    float Funds;
};
class Manager : public Director
{  float Expenses;
public:
   void Display();
   Manager();
}
```

1. a) Which constructor will be called first at the time of declaration of an object of class Manager?

b) How many bytes will an object belonging to class Manager require?

2 Name the member function(s), which are directly accessible from the object of class Manager.

3 Is the data member Funds accessible by the object of the class Manager and why?

4. If the class Manager is derived in protected mode in place of public then, give the names of inherited members in the protected section only?

3 (a) Write a function in c++ which accepts a 2D array of integers, number of rows and number of columns as arguments and assign the elements which are divisible by 3 or 5 into a one dimensional array of integers. **3**

If the 2D array is $\begin{bmatrix} 12 & 3 & 9 & 14 \\ 24 & 25 & 16 & 31 \\ 19 & 32 & 45 & 27 \\ 11 & 5 & 28 & 18 \end{bmatrix}$

The resultant 1D arrays is 12 , 3 , 9 , 24 , 25 , 45 , 9 , 5 , 18

(b) An array A [-2...5] [-4...1] is stored in the memory with each element occupying 4 bytes of space. Assuming the address of A [0] [-1] is 1000 then compute the base address of A and also the address of A [4] [1], when the array is stored as row wise. **3**

(c) (i) Define functions stackpush( ) to insert nodes and stackpop() to delete nodes, for a linked list implemented stack having the following structure for each node. **2**

```
struct ticket
{
    long ticketno;
    char name[40];
    ticket *next;
};
```

(ii) Write a function FindPlayer() in C++ to find & display the record of a player from a dynamically allocated Queue implemented with the help of following structure. The function will receive the Front, Rear and the player ID to be search from Queue as arguments. (Assume the queue is already created with some elements.)

```
struct Cricket
{   int Pid;              // Player ID
    char Pname[20];  // Player Name
    char Type[20];    // Batsman or Bowler or Keeper or Others
Cricket *next;
}*Front, *Rear;
```

(d) Write a function TRANSFORM(int A[][3], int N, int M) in c++ to swap the elements of first and last row.**2**

(e) Evaluate the following Postfix expression showing the stack contents. **2**

2 , 4 , * , 3 , ─ , 10 , 5 , + , /

4 (a) Observe the program segment givenbelow carefully and answer the questions that following: **1**

```
class PracFile
{
    int Pracno;
    char PracName[20];
    int TimeTaken;
    int Marks;
public:
    void EnterPrac( );          // function to enter PracFile details
    void ShowPrac( ):           // function to display PracFile details
    int RTime()                 // function to return TimeTaken
```

```
        {                   return TimeTaken;
        }
        void Assignmarks (int M) // function to assign Marks
         {
        Marks = M;
        }
        };
void AllocateMarks( )
{
 fstreamFile;
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 in C++ to count and display the number of words starting with alphabet 'u' or 'U' or 't' or 'T' or 'k' or 'K' present in a text file "poem.txt". **2**

Example

If the file "poem.txt" contains the following lines,

Kamlesh is captain of Udaipur cricket team.

Tourist generally visit Zoo of udaipur.

Today telephone is dead, please note down complain.

The function should display the output as **7**

(c) Given a binary file "AMOUNT.DAT",containing records of the given class outstand type. **3**

```
class outstand
{
        int memno;
```

```
    int outamt;
  public:
    void getit()
    {     cin>>memno>>outamt;     }
    void putit()
    {     cout<<memno<<outamt;    }
    int returnamt()
    {     return outamt;          }
};
```

Write a function in C++ to write objects having outamt more than Rs. 10,000 into CRITICAL.DAT file

5(a) What is a relation? What is the difference between a tuple and an attribute? **2**

(b) Consider the following tables EMPLOYEEand DESIG. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) **6**

EMPLOYEE

W_ID	FIRSTNAME	LASTNAME	CITY
102	SAM	TONES	PARIS
105	SARAH	ACKERMAN	NEW YORK
144	MANILA	SENGUPTA	NEW DELHI
210	GEORGE	SMITH	HOWARD
255	MARY	JONES	HUSTON
300	ROBERT	SAMUEL	WASHINGTON
335	HENRY	WILLIAMS	BOSTON
400	RONNY	LEE	NEW YORK
451	PAT	THOMPSON	PARIS

DESIGNATION

W_ID	SALARY	BENEFITS	DESIGNATION
102	75000	15000	MANAGER
105	85000	25000	DIRECTOR
144	70000	15000	MANAGER
210	75000	12500	MANAGER
255	50000	12000	CLERK
300	45000	10000	CLERK
335	40000	10000	CLERK
400	32000	7500	SALESMAN
451	28000	7500	SALESMAN

i). Display FirstName and City of Employee having salary between 50,000 and 90,000

ii). Display details of Employees who are from "PARIS" city.

iii). Increase the benefits of employee having W_ID = 210 by 500.

iv). Count number of employees whose name starts from character 'S'.

v). Select MAX(salary) from desig;

vi). Select FirstName from employee, desig
where designation = 'MANAGER' AND employee.W_ID = desig.W_ID;

vii). Select COUNT (DISTINCT designation) from desig;

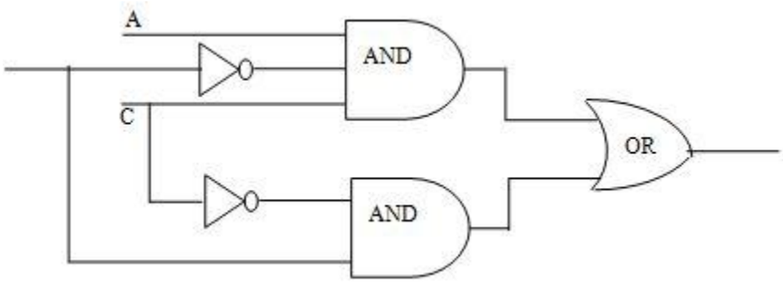
viii). Select designation, SUM(salary) from desig
Group by designation
Having count (*) > 2;

6 (a) State the Distributive Theorems and verify the same using truth table. **2**

(b) Write the Product of Sum form of the function F(x , y , z), truth table representation of F is given below: **1**

X	Y	Z	F
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

(c) Write the equivalent Boolean Expression for the following Logic Circuit. **2**



(d) Reduce the following Boolean Expression using K-Map **3**

F(A,B,C,D) = ∑(5,6,7,8,9,12,13,14,15)

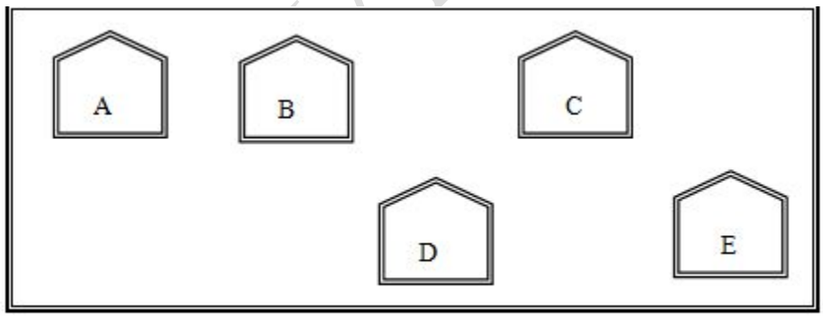
7. (a) Define the term Hacker and Cracker? **1**

(b) What is the difference between the downloading and uploading? **1**

(c) How does firewall protected our network ? **1**

(d) What is the difference between the switch and bridge. **1**

(e) Standard Bank has set up its new center in India for its office and web based activities. It has five buildings as shown in the diagram below:



Distance between various buildings	
A to B	50 Mts
B to C	30 Mts
C to D	30 Mts
D to E	35 Mts
E to C	40 Mts
D to A	120 Mts
D to B	45 Mts
E to B	65 Mts

No of computers	
A	55
B	180
C	60
D	55
E	70

i). Suggest a possible cable layout for connecting the buildings. **1**

ii). Suggest the most suitable place to install the server of this organization with a suitable reason. **1**

iii). Suggest the placement of the following devices with justification. **1**

a) Hub/Switch

b) Modem

iv) The company wants to link its head office in 'A' building to its Office in Sydney **1**

a) Which type of transmission medium is appropriate for such a link?

b) What type of network this connection result into?

(f) Compare prosperity software and .open source software? **1**

(g) How are Trojan Horses different from Wroms ? Mention any one difference. **1**