PRE-BOARD EXAMINATION - II (2019-20)
COMPUTER SCIENCE - 283

Time: 3hrs

CLASS: XII

Max.Marks: 70

Instructions:

i. **All questions are compulsory.**
ii. **Answer the questions after reading the text carefully.**

SECTION A

1) (a) Write the type of C++ Operators (Arithmetic, Logical, and Relational Operators) from the following:

(i) !   (ii) !=   (iii) &&   (iv) %   **2**

(b) Which C++ header files are essentially required to be included to run/execute the following C++ code.   **1**

```
void main()
{
char text[20], newText[20];
gets(text);
strcpy(newText,text);
for(int i=0;i<strlen(text);i++)
if(text[i]=='A')
text[i]=text[i]+2;
puts(text);
}
```

(c) Observe the following C++ code carefully and rewrite it after removing any/all syntactical errors (if any) with each correction underlined.   **2**

Note: Assume all required header files are already being included in the program.

```
Typedef Count int;
void main()
{
Count C;
cout<<"Enter the count:";
cin>>C;
for (K = 1; K<=C; K++)
cout<< C "*" K <<endl;
}
```

(d) Write the output of the following C++ program code.   **3**

Note: Assume all required header files are already being included in the program.

```
#define Big(A,B)  (A>B)?A+1:B+2
void main()
{
char W[] = "Exam";
int L=strlen(W);
for(int i =0; i<L-1; i++)
W[i] = Big(W[i],W[i+1]);
cout<<W<<endl;
}
```

(e) Find and write the output of the following C++ program code:

Note: Assume all required header files are already included in the program.   **2**

```
void main()
{
int A[]={10,12,15,17,20,30};
for(int i = 0; i<6; i++)
{
if(A[i]%2==0)
A[i] /= 2;
else if(A[i]%3==0)
A[i] /= 3;
if(A[i]%5==0)
A[i] /= 5;
}
for(i = 0; i<6; i++)
cout<<A[i]<<"#";
}
```

(f) Look at the following C++ code and find the possible output(s) from the options (i) to (iv) following it. Also, write the highest and lowest values that can be assigned in the array A.

Note :
● Assume all the required header files are already being included in the code.
● The function random(n) generates an integer between 0 and n-1.   **2**

```
void main()
{
randomize();
int A[4], C;
for(C=0; C<4; C++)
A[C]=random(C+1)+10;
```

```
for(C=3; C>=0; C--)
cout<<A[C]<<"@";
}
```

(i) 13@10@11@10@   (ii) 15$14$12$10$

(iii) 12@11@13@10@   (iv) 12@11@10@10@

2) (a) What is a copy constructor? Illustrate with a suitable C++ example.   **2**

(b) Observe the following C++ code and answer the questions (i) and (ii).
Note: Assume all necessary files are included.   **2**

```
class EXAM
{
 long Code;
 char EName[20];
 float Marks;
 public:
 EXAM() //Member Function 1
 {
 Code=100;
 strcpy(EName,"Noname");
 Marks=0;
 }
 EXAM(EXAM &E) //Member Function 2
 {
 Code=E.Code+1;
 strcpy(EName,E.EName);
 Marks=E.Marks;
 }
};
void main()
{
 _____ //Statement 1
 _____ //Statement 2
}
```

(i) Which Object Oriented Programming feature is illustrated by the Member Function 1 and Member Function 2 together in the class EXAM?

(ii) Write Statement 1 and Statement 2 to execute Member Function 1 and Member Function 2 respectively.

(c) Define a class Ele_Bill in C++ with the following descriptions: **4**

Private members:

Cname of type character array

Pnumber of type long

No_of_units of type integer

Amount of type float.

Calc_Amount( )

This member function should calculate the amount as No_of_units*cost.

Amount can be calculated accordingto the following conditions:

No_of_units Cost

First 50 units Free

Next 100 units 0.80 @ unit

Next 200 units 1.00 @ unit

Remaining units 1.20 @ unit

Public members:

* A function Accept( ) which allows user to enter Cname, Pnumber, No_of_units and invoke function Calc_Amount().

* A function Display( ) to display the values of all the data members on the screen.

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

```
class Teacher
{
int TCode;
protected:
char Name[20];
public:
Teacher();
 void Enter(); void Show();
};
class Course
{
int ID;
protected:
Char Title[30];
public:
 Course();
 void Initiate();
 void Display();
```

```
};
class Schedule: public Course, private Teacher
{
 int DD,MM,YYYY;
public:
Schedule();
void Start();
 void View();
};
void main()
{
 Schedule S;
}
```

(i) Which type of Inheritance out of the following is illustrated in the above example? Single Level Inheritance, Multilevel Inheritance, Multiple Inheritance.

(ii) Write the names of all the members, which are directly accessible by the member function View() of class Schedule

(iii) Write the names of all the members, which are directly accessible by the object S of class Schedule declared in the main() function.

(iv) What will be the order of execution of the constructors, when the object S of class Schedule is declared inside main() function?

3) (a) Write a user-defined function **AddEnd4(int A[][4], int R, int C)** in C++ to find and display the sum of all the values, which are ending with 4 (i.e., unit place is 4). **2**

For example if the content of array is:

24	16	14
19	5	4

The output should be 42.

(b) An array A[50][30] is stored along the row in the memory with each element requiring 4 bytes of storage. If the element A[10][15] is stored at 21500 then find out the base address of the array   and the memory address of element stored at location A[30][25]? **3**

(c) Write the definition of a member function **ADDMEM()** for a class QUEUE in C++, to add MEMBER in a dynamically allocated Queue of Members considering the following code is already written as a part of the program.   **4**

```
struct Member
{
 int MNO;
 char MNAME[20];
 Member *Next;
};
class QUEUE
{
 Member *Rear,*Front;
public:
 QUEUE()
{
 Rear=NULL;
Front=NULL;
}
 void ADDMEM();
 void REMOVEMEM();
 ~QUEUE();
};
```

(d) Write a user-defined function **EXTRA_ELE(int A[ ], int B[ ], int N)** in C++ to find and display the extra element in Array A. Array A contains all the elements of array B but one more element extra. (Restriction: array elements are not in order)

Example:
 If the elements of Array A is 14, 21, 5, 19, 8, 4, 23, 11 and
 the elements of Array B is 23, 8, 19, 4, 14, 11, 5
 Then output will be 21.   **3**

(e) Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion.   **2**

$$P + (Q - R) * S / T$$

4) (a) Write a function **RevText()** to read a text file " Input.txt " and Print only word starting with 'I' in reverse order .   **2**

Example:
 If value in text file is: INDIA IS MY COUNTRY
 Output will be: AIDNI SI MY COUNTRY

(b) A text file named MATTER.TXT contains some text, which needs to be displayed such that every next character is separated by a symbol '#'.   **3**

Write a function definition for **HashDisplay()** in C++ that would display the entire content of the file MATTER.TXT in the desired format.

 Example:
   If the file MATTER.TXT has the following content stored in it:
   THE WORLD IS ROUND
   The function HashDisplay() should display the following content:
   T#H#E# #W#O#R#L#D# #I#S# #R#O#U#N#D#

(c) Find the output of the following C++ code considering that the binary file BOOK.DAT exists on the hard disk with a data of 200 books.   **1**

```
class BOOK
{
int BID;char BName[20];
public:
void Enter();void Display();
};
void main()
{
fstream InFile;
InFile.open("BOOK.DAT",ios::binary|ios::in);
BOOK B;
InFile.seekg(5*sizeof(B));
InFile.read((char*)&B, sizeof(B));
cout<<"Book Number:"<<InFile.tellg()/sizeof(B) + 1;
InFile.seekg(0,ios::end);
cout<<" of "<<InFile.tellg()/sizeof(B)<<endl;
InFile.close();
}
```

SECTION C

5) **(a)** Differentiate primary key and candidate key in a relation?   **2**

(b) Write SQL commands for the queries (i) to (iv) and output for (v) to (viii) based on the tables **Watches** and **Sale** given below.   **6**

Watches

Watchid	Watch_Name	Price	Type	Qty_Store
W001	HighTime	10000	Unisex	100
W002	LifeTime	15000	Ladies	150
W003	Wave	20000	Gents	200
W004	HighFashion	7000	Unisex	250
W005	GoldenTime	25000	Gents	100

Sale

Watchid	Qty_Sold	Quarter
W001	10	1
W003	5	1
W002	20	2
W003	10	2
W001	15	3
W002	20	3
W005	10	3
W003	15	4

i. To display all the details of those watches whose name ends with 'Time'

ii. To display watch's name and price of those watches which have price range in between 5000-15000.

iii. To display total quantity in store of Unisex type watches.

iv. To display watch name and their quantity sold in first quarter.

v. SELECT MAX(PRICE), MIN(QTY_STORE) FROM WATCHES;

vi. SELECT QUARTER, SUM(QTY_SOLD) FROM SALE GROUP BY QUARTER;

vii. SELECT WATCH_NAME, PRICE, TYPE FROM WATCHES W, SALE S WHERE W.WATCHID!=S.WATCHID;

viii. SELECT WATCH_NAME, QTY_STORE, SUM(QTY_SOLD), QTY_STORE - SUM(QTY_SOLD) "STOCK" FROM WATCHES W, SALE S WHERE W.WATCHID=S.WATCHID GROUP BY S.WATCHID;

6) (a) Correct the following boolean statements: **2**

        1. X+1 = X
        2. (A')'=A'
        3. A+A'=0
        4. (A+B)' = A.B

(b) Draw the Logic Circuit of the following Boolean Expression: **2**
(U'+V).(V'+W')

(c) Derive a Canonical SOP expression for a Boolean function F, represented by the following truth table: **1**

U	V	W	F(U,V,W)
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	0

(d) Reduce the following Boolean Expression to its simplest form using K-Map: **3**
F(X,Y,Z,W)= Σ (0,1,2,3,4,5,10,11,14)

7) (a) Classify each of the following Web Scripting as Client Side Scripting and Server Side Scripting:

(i) JavaScripting   (ii) ASP   (iii) VB Scripting   (iv) JSP.   **1**

(b) Give two differences between 3G and 4G telecommunication technologies.   **1**

(c) Expand the following:-   **1**

1. GSM   2. TDMA

(d) The following is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 (known as octets) separated by decimal points.
140.179.220.200
What is it? What is its importance?   **1**

(e) What do you mean by data encryption? For what purpose it is used for?   **1**

(f) Your friend wishes to install a wireless network in his office. Explain him the difference between guided and unguided media.   **1**

(g) Multipurpose Public School, Bangalore is setting up the network between its Different Wings of school campus. There are 4wings named as SENIOR(S), JUNIOR (J), ADMIN (A) and HOSTEL (H).

Multipurpose Public School, Bangalore.
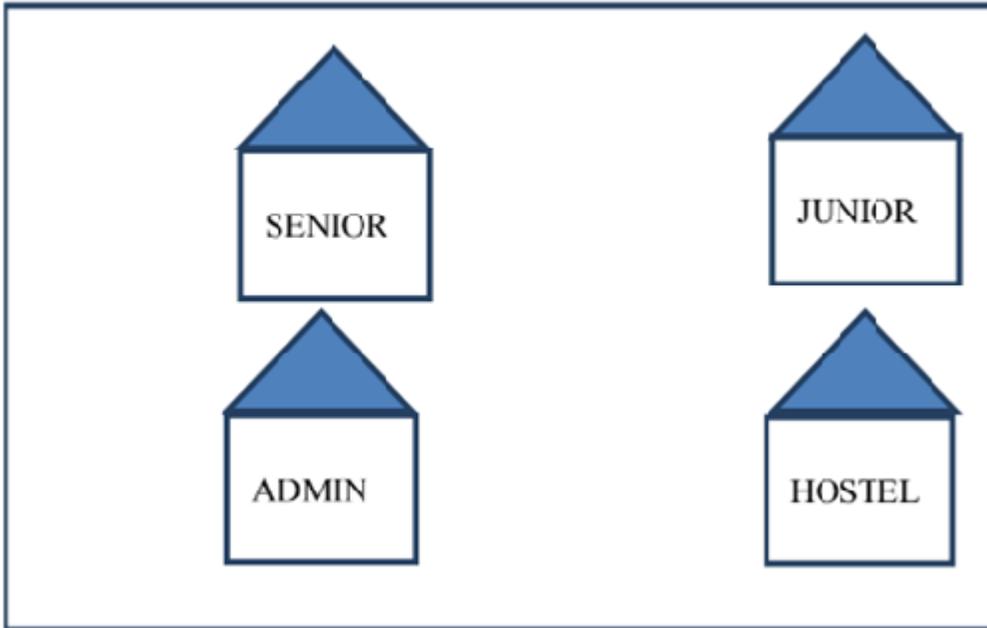
Distancebetweenvariouswingsaregivenbelow:

WingAtoWingS	100m
WingAtoWingJ	200m
WingAtoWingH	400m
WingStoWingJ	300m
WingStoWingH	100m
WingJtoWingH	450m

Number of Computers installed at various wings are as follows:

Wings	NumberofComputers
WingA	20
WingS	150
WingJ	50
WingH	25

(i) Suggest the best wired medium and draw the cable layout to efficiently connect various wings of Multipurpose Public School, Bangalore.   **1**

(ii) Name the most suitable wing where the Server should be installed. Justify your answer.   **1**

(iii) Suggest a device/software and its placement that would provide data security for the entire network of the School.   **1**

(iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smart phone/laptop users in the campus of Multipurpose Public School, Bangalore.   **1**