Class XII
Computer Science - OLD (283)
Sample Question Paper 2019-20

Time allowed: 3 Hours **Max. Marks: 70**

General Instructions:

(a) All questions are compulsory.

(b) Programming Language with C++

(c) *In Question 2(b, d) ,3 and 4 has internal choices.*

Q. No.	Part	Question Description	Marks
1	(a)	Write the type of C++ Operators (Arithmetic, Logical, and Relational Operators) from thefollowing: (i) !(ii) !=(iii) &&(iv) %	(2)

	(b)	Observe the following program very carefully and write the name of those header file(s), which are essentially needed to compile and execute thefollowing program successfully:
		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);
		}
			(1)

	(c)	Rewrite the following C++ code after removing any/all Syntactical Error(s) with each correction underlined.
		
		Note: Assume all required header files are already being included in the program.
		
		#define float PI 3.14
		void main( )
		{
		float R=4.5,H=1.5;
		A=2*PI*R*H + 2*PIpow(R,2);
		cout<<'Area='<<A<<endl;
		}
			(2)

	(d)	Find and write the output of the following C++ program code:
		Note: Assume all required header files are already being included in the program.
		void main( )
		{
		int Ar[ ] = { 6 , 3 , 8 , 10 , 4 , 6 , 7} ;
		int *Ptr = Ar , I ;
		cout<<++*Ptr++ << '@' ;
		I = Ar[3] - Ar[2] ;
		cout<<++*(Ptr+I)<<'@'<<"\n" ;
		cout<<++I + *Ptr++ << '@' ;
		cout<<*Ptr++ <<'@'<< '\n' ;
		for(; I >=0 ; I -=2)
		cout<<Ar[I] << '@' ;
		}
			(3)

	(e)	Find and write the output of the following C++ program code:
		typedef char STRING[80];
		void MIXNOW(STRING S)
		{
		int Size=strlen(S);
		for(int I=0;I<Size;I+=2)
		{
		char WS=S[I];
		S[I]=S[I+1];
		S[I+1]=WS;
		}
		for (I=1;I<Size;I+=2)
		if (S[I]>='M' && S[I]<='U')
		S[I]='@';
		}
		void main()
		{
		STRING Word="CBSEEXAM2019";
		MIXNOW(Word);
		cout<<Word<<endl;
		}
			(2)

	(f)	Observe the following program and find out, which output(s) out of (i) to (iv) willbe expected from the program? What will be the minimum and the maximum value assigned to the variable Alter?
		
		Note: Assume all required header files are already being included in the program.
		void main( )
		{
		randomize();
		int Ar[]={10,7}, N;
			(2)

		int Alter=random(2) + 10 ;
		for (int C=0;C<2;C++)
		{
		N=random(2) ;
		cout<<Ar[N] +Alter<<"#";
		}
		}
		(i) 21#20# (ii) 20#18#
		(iii) 20#17# (iv) 21#17#	

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

	(b)	Write the output of the following C++ code. Also, write the name of feature of Object Oriented Programming used in the following program jointly illustrated by the Function 1 to Function 4.
		void My_fun ( ) // Function 1
		{
		for (int I=1 ; I<=50 ; I++) cout<< "-" ;
		cout<<end1 ;
		}
		void My_fun (int N) // Function 2
		{
		for (int I=1 ; I<=N ; I++) cout<<"*" ;
		cout<<end1 ;
		}
		void My_fun (int A, int B) // Function 3
		{
		for (int I=1. ;I<=B ;I++) cout <<A*I ;
		cout<<end1 ;
		}
		void My_fun (char T, int N) // Function 4
		{
		for (int I=1 ; I<=N ; I++) cout<<T ;
		cout<<end1;
		}
		void main ( )
		{
		int X=7, Y=4, Z=3;
		char C='#' ;
		My_fun (C,Y) ;
		My_fun (X,Z) ;
		}
			(2)

		OR	
		(b) Write any four differences between Constructor and Destructor function with respect to object oriented programming.	

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

	(d)	Answer the questions (i) to (iv) based on the following:
		class Faculty
		{
		int FCode;
		protected:
		char FName[20];
		public:
		Faculty();
		void Enter();
		void Show();
		};
		class Programme
		{
		int PID;
		protected:
		char Title[30];
		public:
		Programme();
		void Commence();
		void View();
		};
		class Schedule: public Programme, Faculty
		{
		int DD,MM,YYYY;
		public:
			(4)

```
        Schedule();
        void Start();
        void View();
};
void main()
{
        Schedule S;             //Statement 1
        _____                   //Statement 2
}
```

(i) Write the names of all the member functions, which are directly accessible by the object S of class Schedule as declared in main() function.

(ii) Write the names of all the members, which are directly accessible by the memberfunction Start( ) of class Schedule.

(iii) Write Statement 2 to call function View( ) of class Programme from the object S of class Schedule.

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

OR

(d) Consider the following class State :

```
class State
{
protected :
int  tp;
public :
State( ) { tp=0;}
void  inctp( ) { tp++;};
int  gettp(); { return  tp; }
};
```

Write a code in C++ to publically derive another class 'District' with the following additional members derived in the public visibility mode.

Data Members :

Dname	string
Distance	float
Population	long int

Member functions :

DINPUT( ) : To enter Dname, Distance and population

DOUTPUT( ) : To display the data members on the screen.

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). For example if the content of array is: The output should be 42	(2)
		OR	
	(a)	Write a user defined function in C++ to find the sum of both left and right diagonal elements from a two dimensional array.	
	(b)	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)
		OR	
	(b)	Write a user defined function Reverse(int A[],int n) which accepts an integer array and its size as arguments(parameters) and reverse the array. Example : if the array is 10,20,30,40,50 then reversed array is 50,40,30,20,10	
	(c)	An array S[10] [30] is stored in the memory along the column with each of its element occupying 2 bytes. Find out the memory location of S[5][10], if element S[2][15] is stored at the location 8200.	(3)
		OR	
	(c)	An array A[30][10] is stored in the memory with each element requiring 4 bytes of storage ,if the base address of A is 4500 ,Find out memory locations of A[12][8], if the content is stored along the row.	
	(d)	Write the definition of a member function Ins_Player() for a class CQUEUE in C++, to add a Player in a statically allocated circular queue of PLAYERs considering the following code is already written as a part of the program: struct Player { long Pid; char Pname[20];	(4)

	24	16	14
	19	5	4

		};
		const int size=10;
		class CQUEUE
		{
		Player Ar[size];
		int Front, Rear;
		public:
		CQUEUE( )
		{
		Front = -1;
		Rear = -1;
		}
		void Ins_Player(); // To add player in a static circular queue
		void Del_Player(); // To remove player from a static circular queue
		void Show_Player(); // To display static circular queue
		};	

		OR	

	(d)	Write a function in C++ to delete a node containing Books information ,from a dynamically allocated stack of Books implemented with the help of the following structure:
		struct Book
		{
		int BNo;
		char BName[20];
		Book *Next;
		};	

	(e)	Convert the following Infix expression to its equivalent Postfix expression, showing the stack contents for each step of conversion. A/B+C*(D-E)	(2)
		OR	
		Evaluate the following Postfix expression : 4,10,5,+,*,15,3,/,-	
4	(a)	Write a function RevText() to read a text file " Input.txt " and Print only word starting with 'I' in reverse order . **Example: If value in text file is: INDIA IS MY COUNTRY** **Output will be: AIDNI SI MY COUNTRY**	(2)
		OR	
	(a)	Write a function in C++ to count the number of lowercase alphabets present in a text file "BOOK..txt".	

	(b)	Write a function in C++ to search and display details, whose destination is "Cochin" from binary file "Bus.Dat". Assuming the binary file is containing the objects of the following class:
		class BUS
		{ int Bno; // Bus Number
		char From[20]; // Bus Starting Point
		char To[20]; // Bus Destination
		public:
		char * StartFrom ( ); { return From; }
		char * EndTo( ); { return To; }
		void input() { cin>>Bno>>; gets(From); get(To); }
		void show( ) { cout<<Bno<< ":"<<From << ":" <<To<<endl; }
		};
			(3)

		OR	

	(b)	Write a function in C++ to add more new objects at the bottom of a binary file "STUDENT.dat", assuming the binary file is containing the objects of the following class :
		class STU
		{
		int Rno;
		char Sname[20];
		public: void Enter()
		{
		cin>>Rno;gets(Sname);
		}
		void show()
		{
		count << Rno<<sname<<endl;
		}
		};	

	(c)	Find the output of the following C++ code considering that the binary file PRODUCT.DAT exists on the hard disk with a list of data of 500 products.
		class PRODUCT
		{
		int PCode;char PName[20];
		public:
		void Entry();void Disp();
		};
		void main()
		{
		fstream In;
		In.open("PRODUCT.DAT",ios::binary|ios::in);
		PRODUCT P;
		In.seekg(0,ios::end);
		cout<<"Total Count: "<<In.tellg()/sizeof(P)<<endl;
			(1)

```
        In.seekg(70*sizeof(P));
        In.read((char*)&P, sizeof(P));
        In.read((char*)&P, sizeof(P));
        cout<<"At Product:"<<In.tellg()/sizeof(P) + 1;
        In.close();
}
```

OR

(c) Which file stream is required for seekg() ?

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

Table:Product

Pno	Name	Qty	PurchaseDate
101	Pen	102	12-12-2011
102	Pencil	201	21-02-2013
103	Eraser	90	09-08-2010
109	Sharpener	90	31-08-2012
113	Clips	900	12-12-2011

(i) Write the names of most appropriate columns, which can be considered as candidate keys.

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

(b) Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables. (4+2)

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARG	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

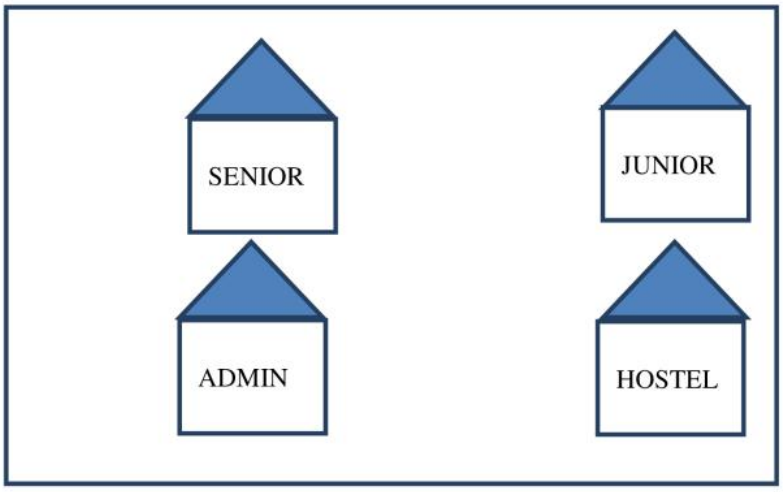
COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	AGDCA	12000	2018-07-02	101
C202	ADCA	15000	2018-07-15	103
C203	DCA	10000	2018-10-01	102
C204	DDTP	9000	2018-09-15	104
C205	DHN	20000	2018-08-01	101
C206	O LEVEL	18000	2018-07-25	105

<table>
<tr><td></td><td>(i)</td><td>Display the Trainer Name, City & Salary in descending order of their Hiredate.</td><td></td></tr>
<tr><td></td><td>(ii)</td><td>To display the TNAME and CITY of Trainer who joined the Institute in the month of December 2001.</td><td></td></tr>
<tr><td></td><td>(iii)</td><td>To display TNAME, HIREDATE, CNAME, STARTDATE from tables TRAINER and COURSE of all those courses whose FEES is less than or equal to 10000.</td><td></td></tr>
<tr><td></td><td>(iv)</td><td>To display number of Trainers from each city.</td><td></td></tr>
<tr><td></td><td>(v)</td><td>SELECT TID, TNAME, FROM TRAINER WHERE CITY NOT IN(‘DELHI’, ‘MUMBAI’);</td><td></td></tr>
<tr><td></td><td>(vi)</td><td>SELECT DISTINCT TID FROM COURSE;</td><td></td></tr>
<tr><td></td><td>(vii)</td><td>SELECT TID, COUNT(*), MIN(FEES) FROM COURSE GROUP BY TID HAVING COUNT(*)>1;</td><td></td></tr>
<tr><td></td><td>(viii)</td><td>SELECT COUNT(*), SUM(FEES) FROM COURSE WHERE STARTDATE< ‘2018-09-15’;</td><td></td></tr>
<tr><td>6</td><td>(a)</td><td>State any one Distributive Law of Boolean Algebra and Verify it using truth table.</td><td>(2)</td></tr>
<tr><td></td><td>(b)</td><td>Draw the Logic Circuit of the following Boolean Expression:
((U + V’).(U + W)). (V + W’)</td><td>(2)</td></tr>
<tr><td></td><td>(c)</td><td>Derive a Canonical SOP expression for a Boolean function F(X,Y,Z) represented by the following truth table:

<table><tr><th>X</th><th>Y</th><th>Z</th><th>F(X,Y,Z)</th></tr><tr><td>0</td><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>0</td><td>1</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td><td>0</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td></tr><tr><td>1</td><td>1</td><td>1</td><td>1</td></tr></table></td><td>(1)</td></tr>
<tr><td></td><td>(d)</td><td>Reduce the following Boolean Expression to its simplest form using K-Map:

F(X,Y,Z,W)= Σ (0,1,2,3,4,5,8,10,11,14)</td><td>(3)</td></tr>
</table>

7	(a)	Arun opened his e-mail and found that his inbox was full of hundreds of unwanted mails. It took him around two hours to delete these unwanted mails and find the relevant ones in his inbox. What may be the cause of his receiving so many unsolicited mails? What can Arun do to prevent this happening in future?	(2)
	(b)	Assume that 50 employees are working in an organization. Each employee has been allotted a separate workstation to work. In this way, all computers are connected through the server and all these workstations are distributed over two floors. In each floor, all the computers are connected to a switch. Identify the type of network?	(1)
	(c)	Your friend wishes to install a wireless network in his office. Explain him the difference between guided and unguided media.	(1)
	(d)	Write the expanded names for the following abbreviated terms used in Networking and Communications: (i) CDMA (ii) HTTP (iii) XML (iv) URL	(2)
	(e)	Multipurpose Public School, Bangluru is Setting up the network between its Different Wings of school campus. There are 4 wings namedasSENIOR(S),JUNIOR(J),ADMIN(A)andHOSTEL(H). Multipurpose Public School, Bangluru  	(4)

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 PublicSchool, Bangluru.

(ii) Namethe most suitablewing wherethe Servershouldbe installed.Justifyyour answer.

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

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