INDIAN SCHOOL DARSAIT
FIRST TERM EXAM- SEPTEMBER, 2018
COMPUTER SCIENCE (083)

Class: XII Max.Marks: 70

ANSWER SCHEME

1.	a)	Explain in brief the purpose of function prototype with the help of a suitable example.
		A function prototype is a declaration of the function that tells the program about the type of the value returned by the function and the number and type of arguments.
		Eg:
		intabsval(int a);
		intgcd(int n1, int n2);
			1
			
			1

	b)	Jayapriya has started learning C++ and has typed the following program. When she compiled the following code written by her, she discovered that she needs to include some header files to successfully compile and execute it. Write the names of those header files, which are required to be included in the code.
		void main()
		{
		float A,Number,Outcome;
		cin>>A>>Number;
		Outcome=pow(A,Number);
		cout<<Outcome<<endl;
		}
		
		iostream.h
		math.h
			1

	c)	Rewrite the following C++ code after removing any/all syntactical errors with each correction underlined.
		Note: Assume all required header files are already being included in the program.
		
		#define Equation(p,q)=p+2*q
		void main()
		{
		float A=3.2;B=4.1;
		C=Equation(A,B);
		cout<<'Output='<<C<<endl;
		}
		
		#define Equation(p,q)p+2*q
		void main()
		{
		float A=3.2,B=4.1;
		float C;
		C=Equation(A,B);
		cout<<"Output="<<C<<endl;
		}
			2

	d)	Find and write the output of the following C++ program code :
		Note: Assume all required header files are already included in the program.
		
		typedef char STRING[80];
		void MIXITNOW(STRING S)
		{
		int Size=strlen(S);
		for(int I=0;I<Size–1;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=”CRACKAJACK”;
		MIXITNOW(Word);
		cout<<Word<<endl;
		}
		
		RCCAAKAJKC
			2

	e)	Find the output of the following program :
		#include<iostream.h>
		void in(int x,int y, int &z)
		{ x+=y;
		y—;
		z*=(x–y);
		}
		void out(int z,int y, int &x)
		{ x*=y;
		y++;
		z/=(x+y);
		}
		void main()
		{ int a=20, b=30, c=10;
		out(a,c,b);
		cout<<a<<"#"<<b<<"#"<<c<<"#"<<endl;
		in(b,c,a);
		cout<<a<<"@"<<b<<"@"<<c<<"@"<<endl;
		out(a,b,c);
		cout<<a<<"$"<<b<<"$"<<c<<"$"<<endl;
		}
		
		20#300#10#
		6020@300@10@
		6020$300$3000$
			3

2.	a)	How does OOP overcome the shortcoming of traditional programming approaches? OOP provides the following advantages to overcome the shortcomings of traditional programming app ✓ OOPs is closer to real world model. ✓ Hierarchical relationship among objects can be well-represented through inheritance. ✓ Data can be made hidden or public as per the need. Only the necessary data is exposed enhan security. ✓ Increased modularity adds ease to program development. ✓ Private data is accessible only through designed interface in a way suited to the program.	1
	b)	What is the difference between #define and const? Explain with a suitable example. The #define directive is a **preprocessor** directive; the preprocessor replaces those macros by their body *before* the compiler even sees it. Think of it as an automatic search and replace of your source code. #define SQR(x) (x)*(x) A const variable declaration declares an actual variable in the language, which you can use... well, like a real variable: take its address, pass it around, use cast it, convert it, etc. constint a=10;	2

	c)	Look at the following C++ code and find the possible output(s) from the options (i)to (iv) following it. Also, write the maximum and the minimum values that can be assigned to the variable CHANGER.
		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
		
		void main()
		{
		randomize();
		int CHANGER;
		CHANGER=random(3);
		char CITY[][25]={"DELHI","MUMBAI","KOLKATA","CHENNAI"};
		for(int I=0;I<=CHANGER;I++)
		{
		for(int J=0;J<=I;J++)
		cout<<CITY[J];
		cout<<endl;
		}
		}
			2

(i)	(ii)
DELHI DELHIMUMBAI DELHIMUMBAIKOLKATA	DELHI DELHIMUMBAI DELHIMUMBAIKOLKATA DELHIMUMBAIKOLKATACHENNAI
(iii)	**(iv)**
MUMBAI MUMBAIKOLKATA MUMBAIKOLKATACHENNAI	KOLKATA KOLKATACHENNAI

Min=0, Max=2

		Possible output- (i)	

	e)	Find the output of the following program:
		
		struct GAME
		{ int Score, Bonus;};
		void Play(GAME &g, int N=10)
		{
		g.Score++;
		g.Bonus+=N;
		}
		void main()
		{
		GAME G={110,50};
		Play(G,10);
		cout<<G.Score<<":"<<G.Bonus<<endl;
		Play(G);
		cout<<G.Score<<":"<<G.Bonus<<endl;
		Play(G,15);
		cout<<G.Score<<":"<<G.Bonus<<endl;
		}
		
		111:60
		112:70
		113:85
			3

	f)	Bring out the difference between actual and formal argument with an example.
		Actual arguments:
		The arguments that are passed in a function call are called actual arguments. These arguments are defined in the calling function.
		Formal arguments:
		The formal arguments are the parameters/arguments in a function declaration. The scope of formal arguments is local to the function definition in which they are used. Formal arguments belong to the called function. Formal arguments are a copy of the actual arguments. A change in formal arguments would not be reflected in the actual arguments.
		
		Example:
		#include <stdio.h>
		void sum(int i, int j, int k);
		/* calling function */
		int main() {
		int a = 5;
		// actual arguments
		sum(3, 2 * a, a);
		return 0;
		}
		/* called function */
		/* formal arguments*/
		void sum(int i, int j, int k) {
		int s;
		s = i + j + k;
		printf("sum is %d", s);
		}
		Here 3,2*a,a are actual arguments and i,j,k are formal arguments.
			2

			2

3.	a)	Find and write the output of the following C++ program code:
		Note: Assume all required header files are already being included in the program.
		class Share
		{
		long int Code;
		float Rate;
		int DD;
		public:
		Share(){Code=1000;Rate=100;DD=1;}
		void GetCode(long int C,float R)
		{
		Code=C;
		Rate=R;
		}
		void Update(int Change,int D)
		{
		Rate+=Change;
		DD=D;
		}
		void Status()
		{
		cout<<"Date:"<<DD<<endl;
		cout<<Code<<"#"<<Rate<<endl;
		}
		};
		void main()
		{
		Share S,T,U;
		S.GetCode(1324,350);
		T.GetCode(1435,250);
		S.Update(50,28);
		U.Update(25,26);
		S.Status();
		T.Status();
		U.Status();
		}
		
		Date:28
		1324#400
		Date:1
		1435#250
		Date:26
		1000#125
			3

	b)	Observe the following program carefully and attempt the given questions:
		#include<iostream.h>
		#include<conio.h>
		#include<stdlib.h>
		void main()
		{
		clrscr();
		randomize();
		char courses[][10]={"M.Tech","MCA","MBA","B.Tech"};
		int ch;
			2

		for(int i=1;i<=3;i++)
		{
		ch=random(i)+1;
		cout<<courses[ch]<<"\t";
		}
		getch();
		}
		I. Out of all the four courses stored in the variable courses, which course will never be displayed in the output and which course will always be displayed at first in the output?
		II. Mention the minimum and the maximum value assigned to the variable ch?
		
		I. M.Tech will never be displayed in the output.
		MCA will always be displayed at first in the output.
		II. Minimum value of ch=1
		• Maximum value of ch=3	

	c)	Write a C++ program to find the volume of a circle, sphere and a cylinder. Use the concept of Function Overloading.
		#include<iostream.h>
		#include<conio.h>
		const float pi=3.14;
		float vol(float r) //Circle
		{
		return (4/3)*pi*r*r;
		}
		float vol(float r,float h) //Cylinder
		{
		return (pi*r*r*h);
		}
		float vol(int r)//sphere
		{
		return (4*pi*r*r);
		}
		void main()
		{
		float l,r,b,h,t;
		clrscr();
		t=vol(l.5);
		cout<<"\n\nVolume of Circle: "<<t;
		t=vol(10.5,3.6);
		cout<<"\n\nVolume of Cylinder: "<<t;
		t=vol(3);
		cout<<"\n\nVolume of Sphere: "<<t;
		getch();
		}
			3

	d)	Rewrite the following program after removing syntactical errors (if any). Underline each correction. #include<conio.h> #include<iostream.h> #include<string.h> #include<stdio.h> class product {	2

		int product_code,qty,price;
		char name[20];
		public:
		product(){
		product_code=0;qty=0;price=0;
		name=NULL;
		}
		void entry()
		{
		cout<<"\n Enter code,qty,price";
		cin>>product_code>>qty>>price;
		gets(name);
		}
		void tot_price() {return qty*price;}
		};
		void main()
		{
		p product;
		p.entry();
		cout<<tot_price();
		}
		
		Corrected Code:
		#include<iostream.h>
		#include<string.h>
		#include<stdio.h>
		class product{
		int product_code,qty,price;
		char name[20];
		public:
		product(){
		product_code=0;qty=0;price=0;
		strcpy(name,NULL);}
		void entry()
		{
		cout<<"\n Enter code,qty,price";
		cin>>product_code>>qty>>price;
		gets(name);
		}
		int tot_price() {return qty*price;}
		};
		void main(){
		product p;
		p.entry();
		cout<<p.tot_price();}	

4.	a)	Answer the questions i) and ii) after going through the following program: class Retail { char Category[20]; char Item[20]; int Qty; float Price;	2

		Retail() //Function 1
		{ strcpy(Category,"Cereal");
		strcpy(Item,"Rice");
		Qty=100;
		Price=25;
		}
		public:
		void Show() //Function 2
		{ cout<<Category<<"-"<<Item<<":"<<Qty<<"@"<<Price<<endl;
		}
		};
		void main()
		{ Retail R; //Statement 1
		R.Show(); //Statement 2
		}
		i) Will Statement 1 initialize all the data members for object R with the values given in the Function 1? (Yes Or No).Justify your answer suggesting the correction(s) to be made in the above code.
		ii) What shall be the possible output when the program gets executed? (Assuming, if required-the suggested correction(s) are made in the program)
		i) No, since the constructor Retail has been defined in private section. ½
		Suggested Correction: Constructor Retail() to be defined in public section of class. ½
		ii) Cereal-Rice:100@25	

	b)	Define a class Tour in C++ with the description given below: Private Members: TCode of type string NoofAdults of type integer NoofKids of type integer Kilometres of type integer TotalFare of type float Public Members: • A constructor to assign initial values as follows: TCode with the word "NULL" NoofAdults as 0 NoofKids as 0 Kilometres as 0 TotalFare as 0 • A function AssignFare( ) which calculate and assign the value of the data member TotalFare as follows:- For each Adult: For each Kid the above Fare will be 50% of the Fare mentioned in the above table For example: If Kilometres is 850, NoofAdults = 2 and NoofKids = 3 Then TotalFare should be calculated as NumofAdults * 300 + NoofKids * 150 i.e. 2 * 300 + 3 * 150 = 1050 • A function EnterTour( ) to input the values of the data members TCode, NoofAdults, NoofKids and	4

Kilometres; and invoke the AssignFare( ) function.

• A function ShowTour( ) will display the content of all the data members of a clam "Tour".

Ans:

```
class Tour
 { char TCode[5];
int NoofAdults;
int NoofKids; 1
int Kilometres;
float TotalFare;
 public:
 Tour()
 { TCode = "NULL";
 NoofAdults = 0;
 NoofKids = 0; 1
 Kilometres = 0;
 TotalFare = 0;
 }
void AssignFare( )
{ if(Kilometres>=1000)
 TotalFare = NoofAdults*500 + NoofKids*250;
 else if(Kilometres>=500) 1
 TotalFare = NoofAdults*300 + NoofKids*150;
 else
 TotalFare = NoofAdults*200 + NoofKids*100;
}
void EnterTour( )
{ cin>>TCode;
cin>>NoofAdults;
cin>>NoofKids;
cin>>Kilometres;
AssignFare( ); 1
}
void ShowTour( )
{ cout<<TCode<< " "<<NoofAdults<< " "<<NoofKids<< " "<<Kilometres;
 cout<<TotalFare; 1
}
 };
```

c) Consider the class definition given below and answer the following questions: 4

```
class film
{ int filmid ;
int filmname;
int leadroles
public:
char leadroleinmale[30];
char leadroleinfemale[30];
film( );
accept( );
display( );
};
class commercialfilm : public film
{ int no_of_songs;
```

		flaot costpersong;
		protected:
		int typecode;
		public:
		char remake;
		commercialfilm( );
		acceptcomm( );
		expenceonsong( );
		display( );
		};
		class artfilm : private film
		{ char theme[50];
		public:
		artfilm();
		acceptart( );
		display( );
		};
		i) Which type of Inheritance is shown in the above example?
		ii) What is the size of the object of class artfilm?
		iii) Which data members are accessible through the object of class artfilm?
		iv) Which class constructor will be called first at the time of declaration of an object of class artfilm?
		
		i) Hierarchical Inheritance is shown in the above example.
		ii) 116 bytes
		iii) None
		film class constructor will be called first at the time of declaration of an object of class artfilm.	

5.	a)	Write a function in C++ to count and display the number of lines not starting with alphabet 'A' present in a text file "STORY.TXT".
		Example:
		If the file "STORY.TXT" contains the following lines,
		The rose is red.
		A girl is playing there.
		There is a playground.
		An aeroplane is in the sky.
		Numbers are not allowed in the password.
		
		The function should display the output as 3
		
		void countlines()
		{
		ifstream fin;
		fin.open("STORY.TXT");
		char str[80];
		int count=0;
		while(!fin.eof())
		{
		fin.getline(str,80);
		if(str[0]!='A')
		count++;
		}
			3

		cout<<"Number of lines not starting with A are "<<count;
		fin.close();
		}	

	b)	Write a definition for function BUMPER() in C++ to read each object of a binary file GIFTS.DAT, find and display details of those gifts, which has remarks as "ON DISCOUNT". Assume that the file
		GIFTS.DAT is created with the help of objects of class GIFTS, which is defined below :
		class GIFTS
		{
		int ID; char Gift[20],Remarks[20]; float Price;
		public:
		void Takeonstock()
		{ cin>>ID;gets(Gift); gets(Remarks); cin>>Price; }
		void See()
		{ cout<<ID<<":"<<Gift<<":"<<Price<<"":"<<Remarks<<endl; }
		char *GetRemarks() {return Remarks;} };
		void BUMPER()
		{
		GIFTS G;
		ifstream fin;
		fin.open("GIFTS.DAT", ios::binary);
		while(fin.read((char*)&G, sizeof(G)))
		{
		if(strcmp(G.GetRemarks(),"ON DISCOUNT")==0)
		G.See();
		}
		fin.close(); //Ignore
		}
			3

	c)	Find the output of the following C++ code considering that the
		binary file sp.dat already exists on the hard disk with 2 records in it.
		class sports
		{
		int id;
		char sname[20];
		char coach[20];
		public:
		void entry();
		void show();
		void writing();
		void reading();
		}s;
		
		void sports::reading()
		{
		ifstream i;
		i.open("sp.dat");
		while(1)
		{
		i.read((char*)&s,sizeof(s));
		if(i.eof())
		break;
		else
		cout<<"\n"<<i.tellg();
		}
			2

		i.close();
		}
		void main()
		{
		s.reading();
		}
		
		42
		84	

	d)	What is the difference between seekg() and tellg()? Explain with an example. SEEKG() → is used to move the get pointer to a desired location with respect to a reference point. Syntax: file_pointer.seekg (number of bytes ,Reference point); Example: [math]fin.seekg(10,ios::beg);[/math] TELLG() → is used to know where the get pointer is in a file. Syntax: file_pointer.tellg();	2
6.	a)	Explain what 'Views' in SQL are with an example. A view is a virtual table based on the result-set of an SQL statement. A view contains rows and columns, just like a real table. The fields in a view are fields from one or more real tables in the database. CREATE VIEW view_name AS SELECT column1, column2, ... FROM table_name WHERE condition;	1 1
	b)	Explain UPDATE command with an example. The UPDATE statement is used to modify the existing records in a table. UPDATE table_name SET column1 = value1, column2 = value2, ... WHERE condition; Any example.	1 1
	c)	Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables	

Table : VEHICLE

CODE	VTYPE	PERKM
101	VOLVO BUS	160
102	AC DELUXE BUS	150
103	ORDINARY BUS	90
105	SUV	40
104	CAR	20

1
1
1

Note :

- PERKM is Freight Charges per kilometer
- VTYPE is Vehicle Type

1

0.5

Table : TRAVEL

NO	NAME	TDATE	KM	CODE	NOP
101	Janish Kin	2015-11-13	200	101	32
103	Vedika Sahai	2016-04-21	100	103	45
105	Tarun Ram	2016-03-23	350	102	42
102	John Fen	2016-02-13	90	102	40
107	Ahmed Khan	2015-01-10	75	104	2
104	Raveena	2016-05-28	80	105	4
106	Kripal Anya	2016-02-06	200	101	25

0.5

Note :

- NO is Traveller Number
- KM is Kilometer travelled
- NOP is number of travellers travelled in vehicle
- TDATE is Travel Date

0.5

0.5

(i) To display NO, NAME, TDATE from the table TRAVEL in descendingorder of NO.

(ii) To display the NAME of all the travellers from the table TRAVEL who aretravelling by vehicle with code 101 or 102.

(iii) To display the NO and NAME of those travellers from the table TRAVELwho travelled between '2015-12-31' and '2015-04-01'.

(iv) To display all the details from table TRAVEL for the travellers, who have travelled distance more than 100 KM in ascending order of NOP.

(v) SELECT COUNT (*), CODE FROM TRAVELGROUP BY CODE HAVING COUNT(*)>1;

(vi) SELECT DISTINCT CODE FROM TRAVEL;

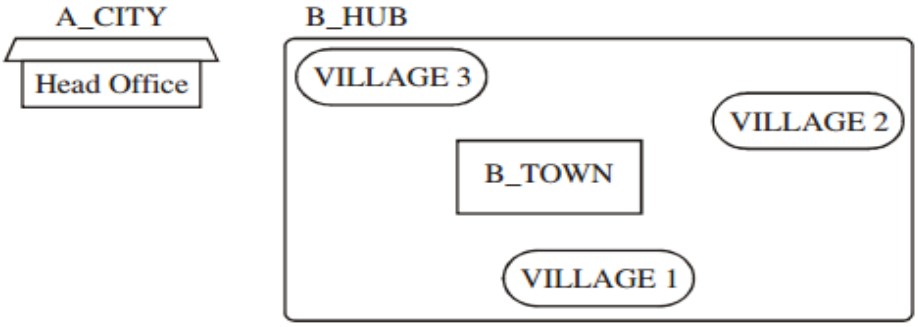
(vii) SELECT A.CODE,NAME,VTYPEFROM TRAVEL A,VEHICLE B WHERE A.CODE=B.CODE AND KM<90;

(viii) SELECT NAME,KM*PERKMFROM TRAVEL A, VEHICLE BWHERE A.CODE=B.CODE AND A.CODE='105';

Ans:

(ix) SELECT NO, NAME, TDATE from TRAVEL ORDER BYNO;
(x) SELECT NAME FROM TRAVEL WHERE CODE=101 OR CODE=102;
(xi) SELECT NO, NAME from TRAVELWHERE TDATE between '2015-12-31' and '2015-04-01';
(xii) SELECT *FROM TRAVEL WHERE KM>100 ORDER BY NOP;

		(xiii) COUNT (*) CODE 2 101 2 102 (xiv) DISTINCT CODE 101 102 103 104 105 (xv) CODE NAME VTYPE 107 Ahmed Khan 104 Raveena Car (xvi) NAME KM*PERKM Tarun Ram 14000	
7.	a)	Give two examples of PAN and LAN type of networks. PAN- LAPTOP AND EARPHONE, PHONE AND SPAKER LAN- BUILDING WITH CMPUTER, COMPUTER LABS	1
	b)	Which protocol helps us to browse through web pages using internet browsers? http	1
	c)	Name any one internet browser. Mozilla firefox	1
	d)	Write two advantages of 4G over 3G Mobile Telecommunication Technologies in terms of speed and services. 4G – Higher data transfer rate - Connects faster	1
	e)	Define cloud computing. The practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.	1
	f)	Categorize the following under Client Side and Server Side script category: (i) VB Script (ii) ASP (iii) JSP (iv) JavaScript Client Side - VB Script , JavaScript Server Side – ASP,JSP	1
	g)	Uplifting Skills Hub India is a knowledge and skill community which has an aim touplift the standard of knowledge and skills in the society. It is planning to setup itstraining centers in multiple towns and villages pan India with its head offices in thenearest cities. They have created a model of their network with a city, a town and 3villages as follows.As a network consultant, you have to suggest the best network related solutions fortheir issues/problems raised in (i) to (iv) keeping in mind the distances betweenvarious locations and other given parameters.	4



Note :

• In Villages, there are community centers, in which one room has been givenas training center to this organization to install computers.

• The organization has got financial support from the government and top ITcompanies.

(i) Suggest the most appropriate location of the SERVER in the B_HUB (out ofthe 4 locations), to get the best and effective connectivity. Justify your answer.

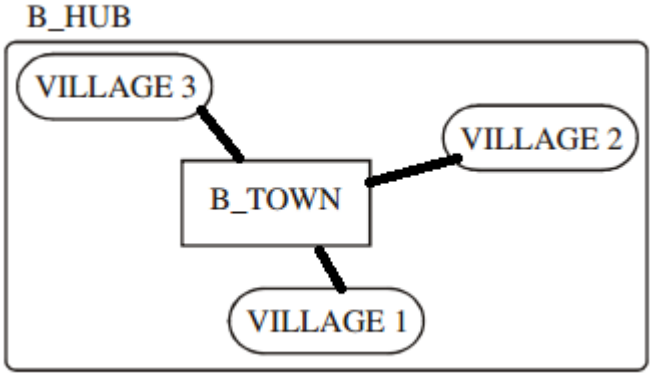
(ii) Suggest the best wired medium and draw the cable layout (location tolocation) to efficiently connect various locations within the B_HUB.

(iii) Which hardware device will you suggest to connect all the computers within each location of B_HUB ?

Which service/protocol will be most helpful to conduct live interactions ofExperts from Head Office and people at all locations of B_HUB ?

(iv) B_TOWN – Most number of computer hence higher connectivity

(v) Optic fibre



(vi) Hub/Switch

(vii) Video conferencing