Pinnacle
DEGREE & DIPLOMA
ENGINEERING

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

Important Instructions to examiners:

1) The answers should be examined by key words and not as word-to-word as given in the model answer scheme.
2) The model answer and the answer written by candidate may vary but the examiner may try to assess the understanding level of the candidate.
3) The language errors such as grammatical, spelling errors should not be given more Importance (Not applicable for subject English and Communication Skills).
4) While assessing figures, examiner may give credit for principal components indicated in the figure. The figures drawn by candidate and model answer may vary. The examiner may give credit for any equivalent figure drawn.
5) Credits may be given step wise for numerical problems. In some cases, the assumed constant values may vary and there may be some difference in the candidate's answers and model answer.
6) In case of some questions credit may be given by judgement on part of examiner of relevant answer based on candidate's understanding.
7) For programming language papers, credit may be given to any other program based on equivalent concept.

Pinnacle

Q. No.	Sub Q.N.	Answer	Marking Scheme
1.	**(a) Ans**	**Attempt any FIVE of the following:** **Define Algorithm** Algorithm:- Algorithm is a stepwise set of instructions written to perform a specific task.	**10** **2M** ***Correct Definition 2M***
	(b) Ans	**Give the significance of <math.h> and <stdio.h> header files.** "math.h" header file supports all the mathematical related functions in C language. stdio.h header file is used for input/output functions like scanf and printf.	**2M** ***Significance of each 1M***

	(c) Ans	**Give syntax of if-else ladder.**
		if(condition_expression_One)
		{
		statement1;
		}
		else if (condition_expression_Two)
		{
		statement2;
			2M
			Correct syntax 2M

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		}
		else if (condition_expression_Three)
		{
		statement3;
		}
		else
		{
		statement4;
		}	

	(d) Ans	**Define Array.** An **array** is a collection of data items, all of the same type, accessed using a common name. A one-dimensional **array** consists of similar type of multiple values in it. A two dimensional **array** consists of row and column.	**2M** ***Definition of array 2M***
	(e) Ans	**Write syntax and use of pow ()function of <math.h> header file.** pow()- compute the power of a input value **Syntax**: double pow (double x, double y);	**2M** ***Syntax and use of pow() 1M each***
	(f) Ans	**Define pointer. Write syntax for pointer declaration.** **Definition:** A pointer is a variable that stores memory address of another variable which is of similar data type. **Declaration:** datatype *pointer_variable_name;	**2M** ***Definition of pointer 1M, Syntax 1M***
	(g)	**Draw and label symbols used in flow chart.**	**2M**

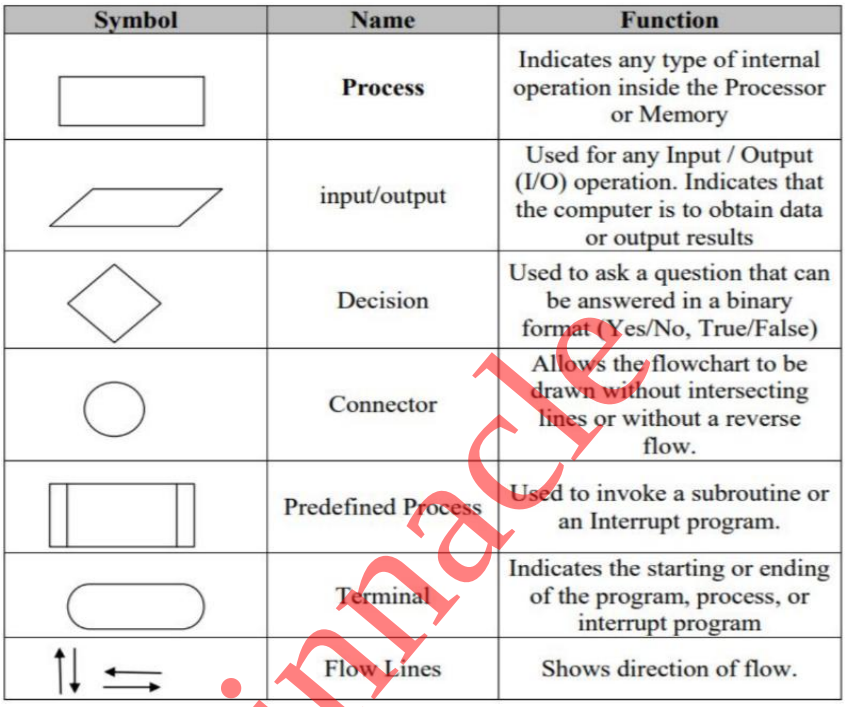
Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

	Ans	 **Symbol** / **Name** / **Function** Process — Indicates any type of internal operation inside the Processor or Memory input/output — Used for any Input / Output (I/O) operation. Indicates that the computer is to obtain data or output results Decision — Used to ask a question that can be answered in a binary format (Yes/No, True/False) Connector — Allows the flowchart to be drawn without intersecting lines or without a reverse flow. Predefined Process — Used to invoke a subroutine or an Interrupt program. Terminal — Indicates the starting or ending of the program, process, or interrupt program Flow Lines — Shows direction of flow.	***Any Four Symbols ½ M each***
2.	**(a)** **Ans**	**Attempt any THREE of the following:** **Write an algorithm to determine whether a given number is divisible by 5 or not** Step 1- Start Step 2- Read / input the number. Step 3- if n%5==0 then goto step 5. Step 4- else number is not divisible by 5 goto step 6. Step 5- display the output number is divisible by 5. Step 6- Stop	**12** **4M** ***Correct algorithm 4M***
	(b) **Ans**	**Explain do-while loop with example.** **Do-While statement**: • In some applications it is necessary to execute the body of the loop before the condition is checked; such situation can be handled by do statement. • At least once the body of loop will be executed. • do statement, first executes the body of the loop. • At the end of the loop, the test condition in the while statement is evaluated. If the condition is true, then it continues to execute body	**4M** ***Explanation 2M,***

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

		of the loop once again.
		• This process continues as long as the condition is true.
		• When the condition becomes false, the loops will be terminated and the control goes to next statement after while statement.
		
		Example:
		#include <stdio.h>
		#include <conio.h>
		void main()
		{
		int i=1;
		clrscr();
		printf("\n Odd numbers from 1 to 20 are \n");
		do
		{
		if(i%2 ! = 0)
		printf("\n %d", i);
		i++;
		}while(i<=20); /* The loop iterates till the value of i is less than or equal to 20 */
		getch();
		}
			Any relevant Example 2M

	(c) Ans	**Explain one dimension and two dimension arrays** i) **One dimensional array**: An array is a collection of variables of the same type that are referred through a common name. A specific element in an array is accessed by an index. In C, all arrays consist of contiguous memory locations. The lowest address corresponds to the first element and the highest address to the last element. Syntax: data_type array_name[array_size]; **Example:** int marks[10]; ii) **Two dimensional array :** Two dimensional array is a collection of similar type of data elements arranged in the form of rows & columns. **Example:** Array can be declared as int arr[3][3]; In this there can be 9 elements in an array with 3 rows and 3 columns.	**4M** ***Explanation of one dimensional and two dimensional array 2M each***

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

	(d) **Ans**	**Write the output of following c program** **#include<stdio.h>** **int main()** **{** **char *ptr;** **char str[]="MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION";** **ptr=str;** **ptr=ptr+11;** **printf("%s", ++ptr);** **return 0;** **}** **Output :** STATE BOARD OF TECHNICAL EDUCATION	**4M** ***Correct output 4M***

3	**(a)**
	Ans
		Attempt any THREE of the following:
		Explain increment and decrement operator.
		Increment operator is used to increment or increase the value of a variable by one. It is equivalent to adding one to the value of the variable. The symbol used is ++. The decrement operator is used to decrement or decrease the value of variable by 1. It is equivalent to subtracting one from the value of the variable. The symbol used is --.
		Syntax: ++var or var++ for increment and --var or var--for decrement.
		
		Example:
		int m=5;
		int n = ++m;
		printf(%d%d",m,n);
		When the increment operator is used prior to the variable name m, the value of the variable m is incremented first and then assigned to the variable n. The values of both the variable m and n here will be 6. But if the increment operator ++ is used after the variable name, then the value of the variable m is assigned to the variable n and then the value of m is increased. Therefore the values of m and n will be 6 and 5 respectively.
		Example for decrement operator
		int m=5;
		int n=--m;
			12
			4M
			
			Explanation of each 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		printf("%d%d",m,n);
		
		or
		#include<stdio.h>
		#include<conio.h>
		void main() {
		int m=4,n=6;
		clrscr();
		printf("values of m and n before changing%d%d",m,n);
		m++;
		n--;
		printf("\nvalues after changing%d%d",m,n);
		getch();
		}	

	(b) Ans	**Explain User defined function with example.**
		Functions are basic building blocks in a program. It can be predefined/ library functions or user defined functions. Predefined functions are those which are already available in C library. User defined functions are those which are written by the users to complete a specific task. Execution of a C program starts from main(). User defined functions should be called from main() for it to execute. A user defined function has a return type and a name. it my or may not contain parameters.
		The general syntax of a user defined function :
		Return_type func_name(parameter list)
		
		Example:
		#include<stdio.h>
		#include<conio.h>
		void myFunc(int a) {
		printf("The value is: %d",a);
		}
		void main() {
		myFunc(10);
		getch()
		}
			4M
			
			Explanation with general syntax 2M
			
			Example 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

	(c) Ans	**Explain conditional operator with example.**
		Conditional operators return one value if condition is true and returns another value is condition is false. This operator is also called as ternary operator as it takes three arguments.
		Syntax :
		(Condition? true_value: false_value);
		
		Example:
		#include<stdio.h>
		#include<conio.h>
		void main() {
		int i;
		clrscr();
		printf("Enter a number:");
		scanf("%d",&i);
		i%2==0?printf("%d is even",i):printf("%d is odd",i) ;
		getch();
		}
			4M
			
			Explanation 2M
			
			Example 2M

	(d) Ans	**Explain strlen() and strcpy() function with example.**
		strlen()- this function is used to find the length of a string. It counts the number of characters comprising the string.
		Syntax:
		strlen(char[] str)- finds the length of the string str.
		
		Example:
		#include<stdio.h>
		#include<conio.h>
		#include<string.h>
		void main() {
		char str[] = "mystring";
		int len=0;
		clrscr();
		len=strlen(str);
		printf("Length of string is :%d",len);
		getch();
		}
		
		Strcpy()– this function is used to copy the contents of a string to other.
			4M
			
			Explanation & Example of each 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		Syntax:
		strcpy(char[] dest, char[] source)- copies the contents of the string source to destination.
		
		Example:
		#include<stdio.h>
		#include<conio.h>
		#include<string.h>
		void main() {
		char source[]="mystring";
		char dest[10];
		clrscr();
		printf("%s%s",source,dest);
		strcpy(dest,source);
		printf("\n%s %s",source, dest);
		getch();
		}	

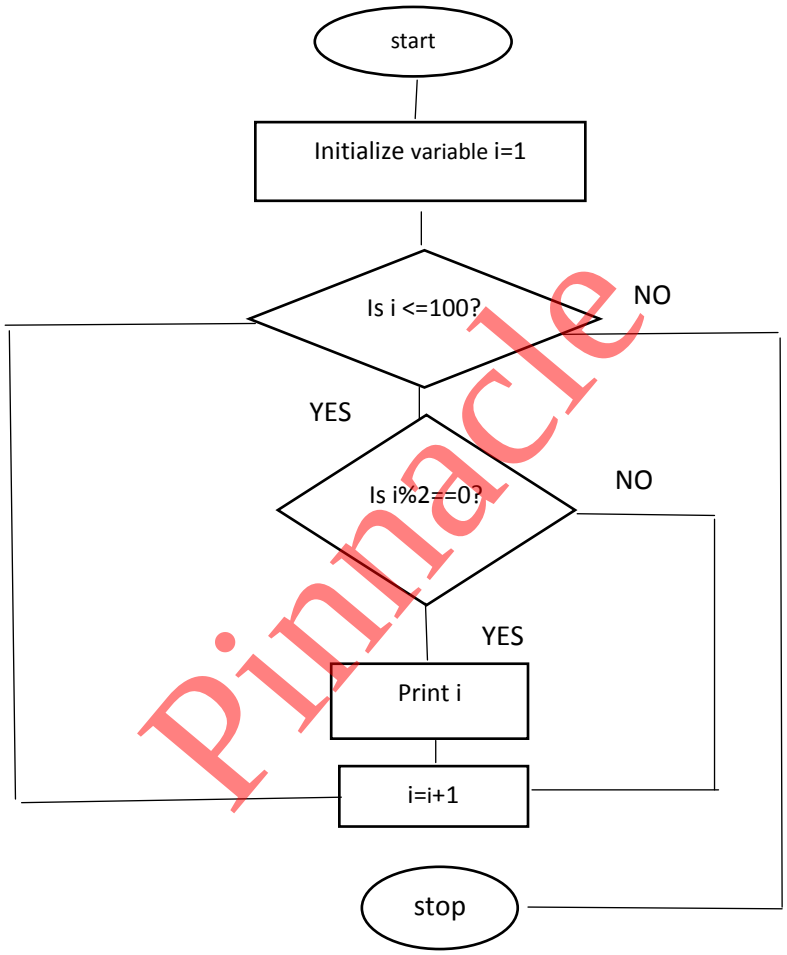
4	**(a)** **Ans**	**Attempt any THREE of the following** **Write algorithm and draw flow-chart to print even numbers from 1 to 100.** Algorithm 1. Start 2. Initialize the variable i to 1. 3. while i<=100 4. if i%2==0 5. print the number 6. increment value of i 7. stop	**12** **4M** ***Algorithm 2M*** ***Flowchart 2M***

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		Flowchart 	

	(b)
	
	Ans
		Write a program to accept marks of four subjects as input from user. Calculate and display total and percentage marks of student.
		Note: ***Any other correct logic shall be considered***
		#include<stdio.h>
		#include<conio.h>
		void main() {
		float marks[4];
		float total=0.0, perc=0.0;
		int i;
			4M
			
			Relevant logic 2M
			
			Syntax 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		clrscr();
		for(i=1;i<=4;i++) {
		printf("Enter marks of subject %d",i);
		scanf("%f%",&marks[i]);
		}
		for(i=1;i<=4;i++){
		total=total+marks[i];
		}
		printf("Total is :%f",total);
		perc=total/4;
		printf("Percentage is %f",perc);
		getch();
		}	

	(c)
	
	Ans
		Write a program to accept the value of year as input from the keyboard & print whether it is a leap year or not.
		#include<stdio.h>
		#include<conio.h>
		void main() {
		int year;
		clrscr();
		printf("Enter year");
		scanf("%d",&year);
		if(year%4==0) {
		printf("Year %d is a leap year",year);
		} else {
		printf("Year %d is not a leap year",year);
		}
		getch();
		}
			4M
			
			Correct Logic 2M
			
			Correct Syntax 2M

	(d)
	
	Ans
		Write a program to accept a string as input from user and determine its length. [Don't use built in library function strlen()]
		#include<stdio.h>
		#include<conio.h>
		void main(){
		char str[50];
		int i, len=0;
		clrscr();
		printf("Enter a string");
			4M
			
			Correct Logic 2M
			
			Correct Syntax 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

		scanf("%s",&str);
		for(i=0; str[i]!='\0'; i++){
		len++;
		}
		printf("The length of string is %d",len);
		getch();
		}	

	(e)
	Ans
		Write a program to swap two numbers using call be value.
		#include<stdio.h>
		#include<conio.h>
		void swap(int a, int b) {
		int temp;
		temp=a;
		a=b;
		b=temp;
		printf("Numbers after swapping no1=%d and no2=%d",a,b);
		}
		void main() {
		int no1, no2;
		clrscr();
		printf("Enter the 2 numbers");
		scanf("%d%d",&no1,&no2);
		printf("Numbers before swapping no1=%d and no2= %d",no1, no2);
		swap(no1,no2);
		getch();
		}
			4M
			Correct Logic 2M
			Correct Syntax 2M

5	**(a)**
	Ans
		Attempt any TWO of the following:
		Write a program using switch statement to check whether entered character is VOWEL or CONSONANT
		Note : Assume that the entered character is only alphabet.
		#include<stdio.h>
		#include<conio.h>
		void main()
		{
		char ch;
		clrscr();
		printf("Enter character:");
		scanf("%c",&ch);
			12
			6M
			character input- 2M

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		switch(ch)
		{
		case 'a':
		case 'e':
		case 'i':
		case 'o':
		case 'u':
		case 'A':
		case 'E':
		case 'I':
		case 'O':
		case 'U':
		printf("\n Entered character is VOWEL");
		break;
		default:
		printf("\n Entered character is CONSONANT");
		}
		getch();
		}
			Display vowel- 2M
			
			Display consonant 2M

	(b) Ans	**Write a program for addition of two 3 x 3 matrices.**
		#include<stdio.h>
		#include<conio.h>
		void main()
		{
		int a[3][3],b[3][3],c[3][3],i,j;
		clrscr();
		printf("Enter first matrix elements:\n");
		for(i=0;i<3;i++)
		{
		for(j=0;j<3;j++)
		{
		scanf("%d",&a[i][j]);
		}
		}
		printf("\nEnter second matrix elements:\n");
		for(i=0;i<3;i++)
		{
		for(j=0;j<3;j++)
			6M
			
			Input of two matrices 2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		{
		scanf("%d",&b[i][j]);
		}
		}
		for(i=0;i<3;i++)
		{
		for(j=0;j<3;j++)
		{
		c[i][j]=a[i][j]+b[i][j];
		}
		}
		printf("\n\nAddition of two matrices is:");
		for(i=0;i<3;i++)
		{
		for(j=0;j<3;j++)
		{
		printf("%d\t",c[i][j]);
		}
		}
		getch();
		}
			Addition of matrices 2M
			
			Display of addition 2M

	(c)
	
	Ans
		Write a program to Print values of variables and their addresses.
		Note : 1) Variables can be of any data type.
		2)Use of & or pointer to display address shall be considered.
		#include<stdio.h>
		#include<conio.h>
		void main()
		{
		int a,b;
		clrscr();
		a=5;
		b=10;
		printf("\n Value of a=%d",a);
		printf("\n Address of a=%u",&a);
		printf("\n Value of b=%d",b);
		printf("\n Address of b=%u",&b);
		getch();
		}
			6M
			
			Display values of variable- 3M
			
			Display address of variable 3M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

Pinnacle
DEGREE & DIPLOMA
ENGINEERING

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

6		**Attempt any TWO of the following:**	**12**
	(a)	**Write a program to declare structure employee having data member name, age, street and city. Accept data for two employees and display it.** ***Note : Two structure variables or array of structure variables shall be considered.***	**6M**

	Ans	#include<stdio.h>
		#include<conio.h>
		struct employee
		{
		char name[10],street[10],city[10];
		int age;
		};
		void main()
		{
		int i;
		struct employee e[2];
		clrscr();
		for(i=0;i<2;i++)
		{
		printf("\n Enter name:");
		scanf("%s",&e[i].name);
		printf("\n Enter age:");
		scanf("%d",&e[i].age);
		printf("\n Enter street:");
		scanf("%s",&e[i].street);
		printf("\n Enter city:");
		scanf("%s",&e[i].city);
		}
		for(i=0;i<2;i++)
		{
		printf("\n Name=%s",e[i].name);
		printf("\n Age=%d",e[i].age);
		printf("\n Street=%s",e[i].street);
		printf("\n City=%s",e[i].city);
		}
		getch();
		}
			Declaration of structure-2M
			Accepting data-2M
			Displaying data2M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION
(Autonomous)
(ISO/IEC - 27001 - 2005 Certified)

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

	(b)
	
	Ans
		If the value of a number (N) is entered through keyboard. Write a program using recursion to calculate and display factorial of number (N).
		#include<stdio.h>
		#include<conio.h>
		int factorial(int N);
		void main()
		{
		int N,fact;
		clrscr();
		printf("Enter number:");
		scanf("%d",&N);
		fact=factorial(N);
		printf("\n Factorial is:%d",fact);
		getch();
		}
		int factorial(int N)
		{
		if(N==1)
		return(1);
		else
		return(N*factorial(N-1));
		}
			6M
			
			Main function definitio n-3M,
			
			Recursiv e function definitio n-3M

	(c)
	
	Ans
		Write a program to accept two numbers from user and perform addition, subtraction, multiplication and division operations using pointer.
		#include<stdio.h>
		#include<conio.h>
		void main()
		{
		int no1,no2,*ptr1,*ptr2,result;
		clrscr();
		printf("Enter no1:");
		scanf("%d",&no1);
		printf("\nEnter no2:");
		scanf("%d",&no2);
		ptr1=&no1;
		ptr2=&no2;
		result=*ptr1+*ptr2;
			6M
			
			Acceptin g numbers 1M
			
			Pointer initializa tion-1M
			
			Addition 1M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228

WINTER – 2018 EXAMINATION
MODEL ANSWER

Subject: Programming in C **Subject Code:** 22226

		printf("\n Addition=%d",result);
		result=*ptr1-*ptr2;
		printf("\n Subtraction=%d",result);
		result=*ptr1**ptr2;
		printf("\n Multiplication=%d",result);
		result=*ptr1/(*ptr2);
		printf("\n Division=%d",result);
		getch();
		}
			subtraction-1M
			
			multiplication-1M
			
			division-1M

Pinnacle

OUR CENTERS :
KALYAN | DOMBIVLI | THANE | NERUL | DADAR
Contact - 9136008228