RV Educational Institutions
RV College of Engineering

Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi

Approved by AICTE, New Delhi

RVCE
1RV22AI007

Academic year 2022-2023 (Even Sem)

DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING

Date	11-07-2023	**Maximum Marks**	50
Course Code	22CS23	**Duration**	90 Minutes
Sem	II Semester		

PRINCIPLES OF PROGRAMMING USING C

CIE-1

Sl. No.		PART-B	M	BT	CO
1	(a)	If John can drink one barrel of water in 6 days, and Mary can drink one barrel of water in 12 days, how long would it take them to drink one barrel of water together?	04	L3	CO2
	(b)	Write an Algorithm and a Flowchart to Swap Two Numbers without using temporary variable.	06	L2	CO1
2	(a)	Write a C Program using switch to Simulate the Calculator using Arithmetic operators (+, -, *, /, %) declaring the appropriate type of variables required for the evaluation.	06	L3	CO3
	(b)	Discuss the process of compiling and running a C program with neat diagram.	04	L1	CO1
3	(a)	Write a C program to enter the temperature T and print the following message according to the given temperature by using the else if ladder statement. T<=0 "It is very cold" 0<T<=15 "It is cold" 15<T<=30 "It is warm" T>30 "It is hot"	05	L3	CO3
	(b)	Write a C program to display the number in reverse order. Ex: Input: Number is 1234, Output: Number in reverse order is 4321	05	L3	CO3
4	(a)	Explain the working of break and continue statements by writing a C program.	04	L2	CO2
	(b)	Give the priority and associativity of the operators and also show the step-wise evaluation of the expression. a + 2 > b || !c && a == d || a – 2 <= e where a=11, b=6, c=0, d=7 and e =5	06	L2	CO2
5	(a)	Find the value of a >>3 and a<<3, when a=7.	04	L2	CO2
	(b)	Demonstrate diagrammatically and justify conversion of types in a mixed expression given below: char c; int j; float f; double d,r; r = (c*j)+(f/j)-(f+d);	06	L3	CO2

R V College of Engineering
Department of Computer Science and Engineering
CIE - II: Question Paper

Subject : (Code)	**Principles of programming using C (22CS23)**	**Semester :**	**2nd BE**
Date :22/08/2023	**Duration :** 90 minutes	**Staff :**	
Name :	**USN :**	**Section :**	

	PART-A	M	BT	Co
1.	Write a program to perform the following operations using user defined functions. a. To read n integer numbers from the user b. To print largest of n numbers and its position c. To print smallest of n numbers and its position Note: Use the category – Function with arguments and no return value.	10	L3	2
2a.	Create a function that takes an integer parameter representing the day number of the week and print the corresponding name of the day. For instance, if dayno=1, the day is Sunday.	6	L2	3
2b.	Explain the compile time and run time initialization of two dimensional arrays with examples.	4	L1	2
3.	Write a C program to read First Name, Middle Name and Last Name of an employee and store the concatenated three names in to a new character array without using built-in function. And print the full name of an employee.	10	L3	3
4a.	Compare the following functions with syntax and examples for each. i) gets( ) and puts( ) ii) strcat( ) and strncat( ) iii) strcmp( ) and strncmp( )	6	L1	2
4b.	Write a program to copy one string into another without using string handling library function.	4	L2	2
5.	Write a C program to read a matrix and perform the following operations: a) Transpose of a given matrix b) Sum of the primary diagonal elements of a matrix	10	L2	3

CO1	Apply logical skills to solve the engineering problems using C programming constructs
CO2	Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem.
CO3	Design a sustainable solution using C programming with societal and environmental concern by engaging in lifelong learning for emerging technology
CO4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports

	L1	L2	L3	L4	L5	L6	CO1	CO2	CO3	CO4
Total Marks	10	20	20	-	-	-	-	24	26	

	R V College of Engineering **Department of Computer Science and Engineering** **Improvement Test Question Paper**	
Subject : (Code)	**Principles of programming using C (22CS23)**	**Semester : 2nd BE**
Date :7/09/2023	**Duration :** 90 minutes	**Staff :**
Name :	**USN :** 1RV22AI007	**Section :**

	PART-A	M	BT	Co
1a.	Write a C Program to demonstrate working of malloc().	6	L3	1
1b.	What will happen if we add or subtract a integer to or form pointer variable explain with appropriate example.	4	L2	1
2a.	Write a C program to print the Fibonacci series using recursion.	6	L2	3
2b.	Explain the utility of typedef keyword in structure with example.	4	L1	2
3a.	Write a C program to create the structure called complex with real and imaginary as members and perform the addition of two numbers.	6	L3	3
3b.	Explain with example how structures are initialized.	4	L2	1
4a.	Write a program to reverse the string using pointers.	6	L1	3
4b.	Explain the passing induvial members of structures to functions with example.	4	L2	2
5a.	Write a 'C' program to swap the values of two variables by using call by reference	6	L2	3
5b.	Is it possible to create an array of structures? Explain with example	4	L1	2

CO1	Apply logical skills to solve the engineering problems using C programming constructs
CO2	Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem.
CO3	Design a sustainable solution using C programming with societal and environmental concern by engaging in lifelong learning for emerging technology
CO4	Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports.

	L1	L2	L3	L4	L5	L6	CO1	CO2	CO3	CO4
Total Marks	14	24	12	-	-	-	14	12	24	-

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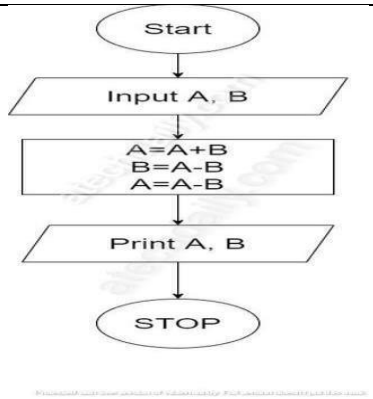
Academic year 2022-2023 (Even Sem)

DEPARTMENT OF **COMPUTER SCIENCE AND ENGINEERING**			
Date	11-07-2023	**Maximum Marks**	50
Course Code	22CS23	**Duration**	90 Minutes
Sem	II Semester		
PRINCIPLES OF PROGRAMMING USING C CIE-1			

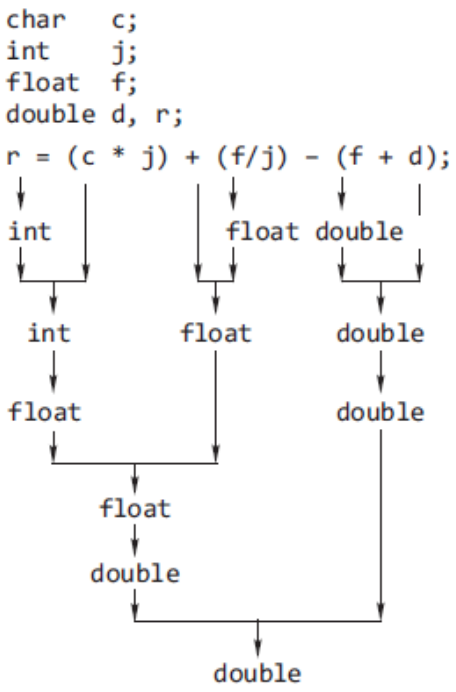
Instructions to students:

1. Answer all questions
2. All questions carry equal marks

Sl. No.		PART-B	M	BT	CO
1	(a)	If John can drink one barrel of water in 6 days, and Mary can drink one barrel of water in 12 days, how long would it take them to drink one barrel of water together? **Ans:** **Each day, John drinks 1/6th a barrel, or, for later convenience, 2/12ths** **Each day Mary drinks 1/12th a barrel** **So, the two together drink 3/12ths, or 1/4 barrel per day** **¼ * x =1 ; x=4** **Thus, it will take 4 days to drink the whole thing.**	04	L3	CO2
	(b)	Write an Algorithm and a Flowchart to Swap Two Numbers without using temporary variable. **Ans:** **Algorithm: 2.5m** ○ **STEP 1: START** ○ **STEP 2: ENTER x, y** ○ **STEP 3: PRINT x, y** ○ **STEP 4: x = x + y** ○ **STEP 5: y= x - y** ○ **STEP 6: x =x - y** ○ **STEP 7: PRINT x, y** **STEP 8: END** **Flowchart: 2.5 m**	06	L2	CO1

					
2	**(a)**	Write a C Program using switch to Simulate the Calculator using Arithmetic operators (+, -, *, /, %) declaring the appropriate type of variables required for the evaluation. **Ans:** **Declaration of the variables: 2m** **Arithmetic operator logic : 4m**	06	L3	CO3
	(b)	Discuss the process of compiling and running a C program with neat diagram. **Ans:** **Process: 2m** **Diagram:2m**	04	L1	CO1
3	**(a)**	Write a C program to enter the temperature T and print the following message according to the given temperature by using the else if ladder statement. T<=0 "It is very cold" 0<T<=15 "It is cold" 15<T<=30 "It is warm" T>30 "It is hot" **Ans: Declaration and reading of required data - 1 mark** **Writing correct if statement - 4 marks**	05	L3	CO3
	(b)	Write a C program to display the number in reverse order. Ex: Input: Number is 1234, Output: Number in reverse order is 4321 **Ans:** **#include <stdio.h>** **void main(){** **int num,r,sum=0,t;** **printf("Input a number: ");** **scanf("%d",&num);** **for(t=num;num!=0;num=num/10){** **r=num % 10;** **sum=sum*10+r;** **}**	05	L3	CO3

		printf("The number in reverse order is : %d \n",sum); **}**			
4	**(a)**	Explain the working of break and continue statements by writing a C program. **Ans:** **Explanation with proper example for break - 2 marks** **Explanation with proper example for continue - 2 marks**	04	L2	CO2
	(b)	Give the priority and associativity of the operators and also show the step-wise evaluation of the expression. a + 2 > b || !c && a == d || a – 2 <= e where a=11, b=6, c=0, d=7 and e =5 **Ans:** **Priority : !, +, -, >, <=, ==, &&, || -2m** **Associativity -2m** **Evaluation – 2m** **Result = 1.**	06	L2	CO2
5	**(a)**	Find the value of a >>3 and a<<3, when a=7. **Ans: a>>3 = 112, a<<3 = 1.**	04	L2	CO2
	(b)	Demonstrate diagrammatically and justify conversion of types in a mixed expression given below: char c; int j; float f; double d,r; r = (c*j)+(f/j)-(f+d); **Ans:**	06	L3	CO2



Diagrammatic Representation -04 marks

Explanation of conversion of types – 02 marks.

COURSE OUTCOMES:

CO1: Apply logical skills to solve the engineering problems using C programming constructs

CO2: Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem..

CO3: Design a sustainable solution using C programming with societal and environmental concern by engaging in lifelong learning for emerging technology.

CO4: Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports

	R V College of Engineering **Department of Computer Science and Engineering** **CIE - II: SCHEME**				
Subject : (Code)	**Principles of programming using C (22CS23)**		**Semester : 2nd BE**		
Date :22/08/2023	**Duration :** 90 minutes	**Staff :**			
Name :	**USN** :	**Section :**			
	PART-A			**M**	**BT**	**Co**
1.	Write a program to perform the following operations using user defined functions. a. To read n integer numbers from the user b. To print largest of n numbers and its position c. To print smallest of n numbers and its position Note: Use the category – Function with arguments and no return value. ANS: main()----------3M { //Read an array values f1(a); f2(a); } void f1(int a[])----------3.5M { int large=a[0]; int pos=0; for(int i=0;i<n;i++) { if(a[i] > large) large=a[i]; pos=i;} printf("%d%d", large,pos+1); } void f2(int a[])----------3.5M { int small=a[0]; int pos=0; for(int i=0;i<n;i++) { if(a[i] < small) small=a[i]; pos=i;} printf("%d%d", small,pos+1); }		10	L3	2
2a.	Create a function that takes an integer parameter representing the day number of the week and print the corresponding name of the day. For instance, if dayno=1, the day is Sunday. ANS: main( ) {		6	L2	3

	//FUNCTION CALL ----------2M } //FUNCTION DEFN----------4M switch(dayno) { case 0: printf("Sunday"); break; case 0: printf("Monday"); break; ---------- }			
2b.	Explain the compile time and run time initialization of two dimensional arrays with examples. ANS: Compile time Initialization----------2M With Examples Run time Initialization----------2M With Examples	4	L1	2
3.	Write a C program to read First Name, Middle Name and Last Name of an employee and store the concatenated three names in to a new character array without using built-in function. And print the full name of an employee. char n1[10]="aa" ;char n2[10]="bb";char n3[10]="cc";----------1M char n[35]; for(i=0;i<n1[i]!='\0';i++) ----------3M n[i]=n1[i]; n[i]=' '; for(j=0;i<n2[j]!='\0';j++)----------3M n[i+j+1]=n2[j]; n[i+j+1]=' '; for(k=0;i<n3[k]!='\0';k++)----------3M n[i+j+k+2]=n3[k]; printf("%s",name);	10	L3	3
4a.	Compare the following functions with syntax and examples for each. i) gets( ) and puts( )----------2M ii) strcat( ) and strncat( ) ----------2M iii) strcmp( ) and strncmp( )----------2M	6	L1	2
4b.	Write a program to copy one string into another without using string handling library function. n- STRING LENGTH for(i=0;i<n;i++) { st1[i]= st2[i];}	4	L2	2

	st[i]='\0';			
5.	Write a C program to read a matrix and perform the following operations: a) Transpose of a given matrix----------5M //Read a matrix -2M //Logic – 3M for(i=0i<m;i++) for(j=0;j<n;j++) { b[j][i]= a[i][j]; } b) Sum of the primary diagonal elements of a matrix----------5M //Read a matrix -2M //Logic – 3M sum=0; for(i=0;i<n;i++) { sum=sum+a[i][i]; }	10	L2	3

CO1	Apply logical skills to solve the engineering problems using C programming constructs
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	L1	L2	L3	L4	L5	L6	CO1	CO2	CO3	CO4
Total Marks	10	20	20	-	-	-	-	24	26	-

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Academic year 2022-2023 (Even Sem)

DEPARTMENT OF **COMPUTER SCIENCE AND ENGINEERING**			
Date	7-09-2023	**Maximum Marks**	50
Course Code	22CS23	**Duration**	90 Minutes
Sem	II Semester		
PRINCIPLES OF PROGRAMMING USING C Improvement Test Scheme and Solution			

Instructions to students:

1. Answer all questions
2. All questions carry equal marks

Sl. No.		PART-B	M	BT	CO
1	(a)	Write a C Program to demonstrate working of malloc() #include <stdio.h> #include <stdlib.h> // use stdlib.h header file to malloc() function int main () { int *pt; // declare a pointer of type int // use malloc() function to define the size of block in bytes pt = malloc (sizeof(int)); // use if condition that defines ptr is not equal to null if (pt != NULL) { printf (" Memory is created using the malloc() function "); } else printf (" memory is not created "); return 0; } -6M	06	L3	1
	(b)	What will happen if we add or subtract a integer to or form pointer variable explain with appropriate example. **Pointer Addition : 1M** When a pointer is added with an integer value, the value is first multiplied by the size of the data type and then added to the pointer. -1M Example: -2M	04	L2	1

		Consider the same example as above where the ptr is an integer pointer that stores 1000 as an address. If we add integer 5 to it using the expression, ptr = ptr + 5, then, the final address stored in the ptr will be ptr = 1000 + sizeof(int) * 5 = 1020. **Pointer Subtraction -1M** When a pointer is subtracted with an integer value, the value is first multiplied by the size of the data type and then subtracted from the pointer similar to addition. Example: -2M Consider the same example as above where the ptr is an integer pointer that stores 1000 as an address. If we subtract integer 5 from it using the expression, ptr = ptr – 5, then, the final address stored in the ptr will be ptr = 1000 – sizeof(int) * 5 = 980.			
2	**(a)**	Write a C program to print the Fibonacci series using recursion. #include<stdio.h> int Fibonacci(int); int main() { int n, i = 0, c; scanf("%d",&n); printf("Fibonacci series\n"); for (c = 1 ; c <= n ; c++) { printf("%d\n", Fibonacci(i)); i++; } return 0; } int Fibonacci(int n) { if (n == 0) return 0;	06	L2	3

		else if (n == 1) return 1; else return (Fibonacci(n-1) + Fibonacci(n-2)); } -6M			
	(b)	Explain the utility of typedef keyword in structure with example There is no longer a need to type struct again and again with every declaration of the variable of this type - 1M Example -3M #include<stdio.h> typedef struct Point{ int x; int y; } Point; int main() { Point p1; p1.x = 1; p1.y = 3; printf("%d \n", p1.x); printf("%d \n", p1.y); return 0; } -4M	04	L1	2
3	**(a)**	Write a C program to create the structure called complex with real and imaginary as members and perform the addition of two numbers. #include <stdio.h> typedef struct complex { -3M float real; float imag; } complex; complex add(complex n1, complex n2); int main() { complex n1, n2, result;	06	L3	3

		printf("For 1st complex number \n"); printf("Enter the real and imaginary parts: "); scanf("%f %f", &n1.real, &n1.imag); printf("\nFor 2nd complex number \n"); printf("Enter the real and imaginary parts: "); scanf("%f %f", &n2.real, &n2.imag); result = add(n1, n2); -3M printf("Sum = %.1f + %.1fi", result.real, result.imag); return 0; } -6M			
	(b)	Explain with example how structures are initialized. There are two ways to do this. 1) Using Dot(.) operator -2M var_name.memeber_name = value; 2) All members assigned in one statement - 2M struct struct_name var_name = {value for memeber1, value for memeber2 …so on for all the members}	04	L2	1
4	**(a)**	Write a program to reverse the string using pointers #include <stdio.h> #include <conio.h> void main() { char *s; int len,i; clrscr(); printf("\nENTER A STRING: "); gets(s); len=strlen(s); printf("\nTHE REVERSE OF THE STRING IS:"); for(i=len;i>=0;i--) printf("%c",*(s+i)); getch();	06	L1	3

		}			
	(b)	Explain the passing induvial members of structures to functions with example? Each member is passed as an argument in the function call and it is call by value method -1M Example Program -5M C program to demonstrate passing individual arguments of structure to a function − #include<stdio.h> struct date{ int day; int mon; int yr; }; main ( ){ struct date d= {02,01,2010}; // struct date d; display(d.day, d.mon, d.yr);// passing individual mem as argument to function getch ( ); } display(int a, int b, int c){ printf("day = %d ", a); printf("month = %d ",b); printf("year = %d ",c); } -4M	04	L2	2
5	**(a)**	Write a 'C' program to swap the values of two variables by using call by reference #include <stdio.h> void swap(int*, int*); int main()	06	L2	3

		{ int x, y; printf("Enter the value of x and y\n"); scanf("%d%d",&x,&y); printf("Before Swapping\nx = %d\ny = %d\n", x, y); swap(&x, &y); printf("After Swapping\nx = %d\ny = %d\n", x, y); return 0; } void swap(int *a, int *b) { int temp; temp = *b; *b = *a; *a = temp; } -6M			
	(b)	Is it possible to create an array of structures? Explain with example Yes it is possible. An array of structures written in C can be described as a collection of numerous structure variables containing data about different entities. It is used to hold information about various entities of diverse data types. The array of structures can also be described as a collection of structure variables. – 2M Example - 1M	04	L1	2

COURSE OUTCOMES:

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CO2: Evaluate the appropriate method/data structure required in C programming to develop solutions by investigating the problem..

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CO4: Demonstrate programming skills to solve inter-disciplinary problems using modern tools effectively by exhibiting team work through oral presentation and written reports

22CS23

USN | 1 | R | V | 2 | 2 | A | I | 0 | 0 | 4 |

RV COLLEGE OF ENGINEERING®

(An Autonomous Institution affiliated to VTU)

II Semester B. E. Examinations October-2023

Common to AI / BT / CS / CY / CD / IS

PRINCIPLES OF PROGRAMMING USING C

Time: 03 Hours *Maximum Marks: 100*

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B. In Part B question number 2 and 11 are compulsory. Answer any one full question from 3 and 4, 5 and 6, 7 and 8, 9 and 10.

PART-A

1	1.1	#include<stdio.h> *int main()* { *printf*("%d" , *printf*("%d" , 1234)); *return* 0;} The output for the following program is _____.	01
	1.2	List any two types of Errors.	01
	1.3	*int* $a = 5, b = 7, c = 12, d = 15, x;$ Evaluate the given expression $X = ++a + ++b + ++c + ++d;$ Print the values of x, a, b, c, d after evaluation.	01
	1.4	When $a = 12345$ and $b = 678$, write the output for the following code: *scanf*("%2d%5d", &a, &b); *printf*("\n a = %d and b = %d", a, b);	01
	1.5	Mention various built-in functions along with its functionality supported for strings in *C*.	01
	1.6	Analyze the following *C* program and write the output. *int main()* { *char arr*[][20] = {"*RVCE*","*BMSCE*","*MSRIT*"}; *printf*("%s\n",*arr*[1]); *printf*("%s\n",*arr*[0]); *return* 0; }	01
	1.7	What is the output of the following code? *#include < stdio.h >* *struct student* { }; *void main()* { *struct student s*[2]; *printf*("%d", *sizeof*(*s*)); }	01

	1.8	What will be the output of the following program? `#include < stdio.h >` `int main()` `{` `char str[20] = "Hello";` `char * const p = str;` `* p = 'M';` `printf(%s\n",str);` `return 0;` `}`	
	1.9	What is the purpose of *fseek* function?	01
	1.10	Give two differences between *calloc*() and *malloc*() functions.	01 01

PART-B

2	a	Write an Algorithm and a Flowchart to print the sum of even terms contained within the numbers 0 to 20.	07
	b	Discuss the process of compiling and running a *C* program with a neat diagram.	07
3	a	Write a *C* program to perform the following operations on a matrix: i) Read the elements of the matrix ii) Add the diagonal elements of a matrix. iii) Sum of all the elements of a Matrix.	06
	b	What is the difference between break and continue? Write a program to reverse a given integer number using a for loop and without using library functions	08
		OR	
4	a	Write a program to recognize whether the given character is vowel or consonant using switch statement.	07
	b	Write a *C* program to display the n terms of harmonic series and find their sum. Harmonic series: $1 + 1/2 + 1/3 + 1/4 + 1/5 \ldots . 1/n$ terms	07
5	a	Write a *C* program to check a string for palindrome using functions to find the length of the string and a function to check the string passed to function for palindrome. (Note Do not use any string handling functions)	10
	b	Describe global variables, local variables and their scope.	04
		OR	
6	a	Write a *C* program to sort the names by writing a function for sorting the names passed as an argument.	08
	b	Discuss different categories of *C* functions with proper examples.	06
7	a	Explain the arithmetic operations that can be carried out using a pointer with an example.	06

	b	What is typedef? Write a *C* program using structures to add two complex numbers. Create a structure *COMPLEX*, and a function AddCompNum() to add two complex numbers.	08
		OR	
8	a	Briefly discuss why we need pointers and its advantages. Write a program in *C* to find the length of the string Using Pointer.	07
	b	Write a *C* Program that prints the $X-Y$ coordinate of two ends of a line using structure.	07
9	a	Define dynamic memory allocation. Write a *C* Program to demonstrate various Dynamic memory allocation and De-allocation functions used in *C*.	08
	b	Define linked list. Explain different types of linked list with an example.	06
		OR	
10	a	Differentiate between static and dynamic memory allocation using a C program	08
	b	Explain the functions used in file operations with an example.	06
11	a	Develop a *C* program to compute average marks of '*n*' students (Name, Roll_No, Test Marks) and search a particular record based on 'Roll_No'	10
	b	Write a *C* program to count number of lines, blank lines and comments in a given program using files.	10