



## CT2 SET1

Programming For Problem Solving (SRM Institute of Science and Technology)



Scan to open on Studocu



**SRM Institute of Science and  
Technology College of Engineering  
and Technology  
School of Computing**

**DEPARTMENT OF  
COMPUTING TECHNOLOGIES**

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu  
Academic Year: 2022-23 (ODD)

Test: CLAT- 2

Course Code & Title: 21CSS101J / Programming for Problem Solving  
mts Year & Sem: I / I

Date:

Duration: 1 hr 40

Max. Marks: 50

**Course Learning Rationale (CLR):**

CLR-2 : Utilize the appropriate operators and control statements to solve engineering

problems CLR-3 : Store and retrieve data in a single and multidimensional array

CLR-4 : Create custom designed functions to perform repetitive tasks in any

**application Course Learning Outcomes (CLO):**

CLO-2 : To use appropriate data types in simple data processing applications. To create programs using the concept of arrays.

CLO-3 : To create string processing applications with single and multi-dimensional arrays.

CLO-4 : To create user-defined functions with required operations. To implement pointers in applications with dynamic memory.

**NOTE:**

- For each 5 mark question, 2 marks logic (as seen in program irrespective of syntax errors) and 3 marks for program.
- Based on number of syntax errors in program, program marks (3) may be allotted.
- There is no need to write #include<stdio.h> for all programs
- There are many ways of writing the same program!

Part - A ( 1 x 25 = 25 Marks ) Instructions: This section has only ONE question with internal choice.						
Q. No	Question	Marks	BL	CO	PO	PI Code

1	<p>Priya went to shopping to buy organic fruits. But the shop owner mixed the hybrid apples in that box. After Priya checked the box, she was confused between organic and hybrid apples. She started to count the hybrid apples. Write a program to help Priya count the total number of hybrid apples in the box.</p> <p>Input: O O O H O O O H H O</p> <p>Output: 7 organic apples</p> <pre> #include &lt;stdio.h&gt; int main() { int counthybapples = 0; char apples[10]; for(i=0; i&lt;10; ++i) { scanf("%c", &amp;apples[i]); if(apples[i] == 'H') counthybapples++; } printf("%d hybrid apples\n", counthybapples); return 0; } </pre>	5	1	2	1	2.1.2
2	<p>The Election Commission of India distributed the voter ID to all eligible citizens. But Amira didn't received a Voter ID on time. So, she gets confused about her eligibility for voting? Write a program to find out the eligibility of based person on age and clarify her doubt?</p> <pre> #include &lt;stdio.h&gt; int main() { int age; scanf("%d",&amp;age); if(age&lt;18) { printf("Not Eligible"); } else { printf("Eligible"); } return 0; } </pre>	5	1	2	1	2.1.2

3	<p>Yusuf is an active young man who is very interested in getting money in a simple way. So he is always looking for a way to get some money. One day, he came to know about a money-making show called 'Crorepati' on a popular channel. So he participated the Crorepati game. It has a dial full of numbers in random order. If it is arranged in specified order, he would win a million-dollar prize. Can you help him to win the game by writing C program?</p> <pre>#include&lt;stdio.h&gt; int main() { int a[100],n; printf("enter no of values"); scanf("%d", &amp;n); for(int i=0; i&lt;n; i++) { printf("enter n values"); scanf("%d",&amp;a[i]); } int i,j,temp; for(i=0; i&lt;n-1; i++) { for(j=0; j&lt;n-i-1; j++) { if(a[j]&gt;a[j+1]) { temp=a[j]; a[j]=a[j+1]; a[j+1]=temp; } } } for(i=0; i&lt;n; i++) { printf("%d ",a[i]); } return 0; }</pre>	5	2	2	1	2.1.2
---	---	---	---	---	---	-------

4	<p>Tina is a B.Tech student. During her final year campus interview, she had an opportunity to get a job in a software company at Bangalore. The company provides five months training period with Rs.40,000/month package.</p> <p>Then it will be incremented to Rs.65, 000 per month. At the end of the training, a test was conducted for all fresher, Tina got a question paper and one of the question is from the concept of programming. The program was that she has to calculate the sum of an array of elements, which are even. Help her to complete the test successfully.</p> <pre>#include &lt;stdio.h&gt; int main() { int N,start; scanf("%d",&amp;N); int arr[N]; for (int i=0;i&lt;N;i++) { printf("enter value"); scanf ("%d",&amp;arr[i]); } int i; for(i=0;i&lt;N;i++) start+=arr[i]; printf("%d",start); }</pre>	5	1	2	1	2.1.2
---	--	---	---	---	---	-------

5	<p>Rathik organized technical round interview in Microsoft for computer science candidates. The problem is to perform addition, subtraction, multiplication, and division of two given numbers. Rathik has given the deadline of only 5 minutes to complete the problem. Can you help the candidates by writing C program to complete the problem within the specified time limit? <b>Note:</b> Rathik instructed the candidates to print the result of the division with 3 values after decimal point.</p> <pre> #include&lt;stdio.h&gt; //#include&lt;conio.h&gt; int main() {     float a,b;     int op;     printf(" 1.Addition\n 2.Subtraction\n 3.Multiplication\n 4.Division\n");     printf("Enter the values of a &amp; b: ");     scanf("%d %d",&amp;a,&amp;b);     printf("Enter your Choice : ");     scanf("%d",&amp;op);     switch(op)     {         case 1:             printf("Sum of %f and %f is : %f",a,b,a+b);             break;         case 2:             printf("Difference of %f and %f is : %f",a,b,a-b);             break;         case 3:             printf("Multiplication of %f and %f is : %f",a,b,a*b);             break;         case 4:             printf("Division of Two Numbers is %.3f : ",a/b);             break;         default:             printf(" Enter Your Correct Choice.");             break;     }     return 0; } </pre>	5	1	2	1	2.1.2
OR						

6	<p>Simon is wasting electricity without caring about it. He leaves all switches ON even when he is not in the room. After a month of using Electricity, his security Guard informed him about increased units of electricity. Due to the electricity bill, Simon gets tensed about his electricity bill. Can you help Simon to calculate his electric bill using C program?</p> <p>Constraints:</p> <table><tr><th>Units</th><th>Charges per unit(Rs)</th></tr><tr><td>Upto 50</td><td>0.50</td></tr><tr><td>Above 50 and less than 150</td><td>0.75</td></tr><tr><td>Above 150 and less than 250</td><td>1.2</td></tr><tr><td>Above 250</td><td>1.5</td></tr></table> <p>If bill exceeds Rs. 300 then a surcharge of 10% will be charged.</p> <pre>#include&lt;stdio.h&gt; float bill(int unit); int main() { int n; scanf("%d", &amp;n); float total = bill(n); printf("%.2f", total); return 0; } float bill(int unit) { if(unit &lt; 50) return unit*0.50; else if(unit &lt;= 50) return (((unit-50)*0.75) + 25); else if(unit &lt;= 250) return (((unit-150)*1.20)+100); else return (((unit-250)*1.50) + 220); return 0; }</pre>	Units	Charges per unit(Rs)	Upto 50	0.50	Above 50 and less than 150	0.75	Above 150 and less than 250	1.2	Above 250	1.5	5	1	2	1	2.1.2
Units	Charges per unit(Rs)															
Upto 50	0.50															
Above 50 and less than 150	0.75															
Above 150 and less than 250	1.2															
Above 250	1.5															
7	<p>Sajid was booking a train ticket from Chennai to Delhi. Two of the relatives was interested in joining that journey. So, Sajid booked tickets for those persons also. At the time of payment he is having Rs.5000/- only.</p> <p>Now you help him by writing C program to calculate total amount needed for their travel and how much balance he has to pay (or) how much balance he will receive. NOTE: 1 Ticket Fair Rs.2000/-</p> <pre>#include &lt;stdio.h&gt; int main() { int paid = 5000; int rel_tickets = 2; printf("Balance to be received is %d", 5000-2000*2); return 0; }</pre>	5	2	2	1	2.1.2										

8	<p>Tharun wants to print a document with "N" pages double- sided, where two pages of data can be printed on one sheet of paper. Can you tell him for printing N pages at least how many sheets of paper does he need?</p> <pre>#include &lt;stdio.h&gt; int main() { int a; scanf("%d",&amp;a); if(a%2==0) { printf("%d",a/2);} else { printf("%d",(a/2)+1); } return 0; }</pre>	5	1	2	1	2.1.2
9	<p>Vishal is fighting with a monster. The health of the monster is H. In one attack, Vishal can decrease the monster's health by 'A'. There is no other way to decrease the monster's health. Vishal wins when the monster's health becomes '0' or below.</p> <p>Can you find the number of attacks needed for Vishal for winning?</p> <pre>#include &lt;stdio.h&gt; int main() { int a,b; scanf ("%d %d",&amp;a, &amp;b); if (a%b==0) { printf("%d",a/b); } else if(a/b!=0) { printf("%d",(a/b)+1); } return 0; }</pre>	5	2	2	1	2.1.2
10	<p>Binita is playing chess. The game will be played on a rectangular grid consisting of N rows and M columns. Initially all the cells of the grid are uncoloured.</p> <p>Binita's initial score is zero. At each turn, she chooses some cell that is yet not colored, and colors that cell. The score obtained in this step will be number of neighboring-colored cells of the cell that Binita colored in this step.</p> <p>Two cells are neighbours of each other if they share a side between them. The game will end when all the cells are colored. Finally, total score obtained at the end of the game will be sum of scores obtained in each turn.</p> <p>Binita wants to know what maximum score she can get? Can you please help her in finding this out?</p> <pre>#include &lt;stdio.h&gt; int main() { int n,m; int a; scanf("%d %d",&amp;n,&amp;m); a = 2*m*n-m-n; printf("%d",a); return 0; }</pre>	5	2	2	1	2.1.2



**Part – B**  
**( 1 x 25 = 25 Marks)**

**Instructions: This section has only ONE question with internal choice.**

11	<p>The sweet seller is stocking the sweet laddus from the box to single container. Each container can hold single laddu only. Now write a C program to help the sweet seller for stocking laddus. The size of the box is M*N.</p> <p>Laddus are equal in size.</p> <p>(If box contains more laddus than containers, then containers get filled and some laddus remain in box. If more containers than laddus in box, some containers remain unfilled)</p> <pre> #include &lt;stdio.h&gt; #include &lt;string.h&gt; int main() { int length, breadth, num_containers; printf("No. of laddus in each row:"); scanf("%d", &amp;length); printf("No. of laddus in each column:"); scanf("%d", &amp;breadth); printf("No. of containers"); scanf("%d", &amp;num_containers); int rem = length*breadth - num_containers; if( rem &gt;= 0) printf("No. of laddus remaining in box after filling %d containers is %d", num_containers, rem); else{ printf("Laddus over after filling %d containers\n", length*breadth); printf("No of containers remaining to fill is %d", -rem); } return 0; }</pre>	5	2	3	1	2.1.3
----	---	---	---	---	---	-------

12	<p>Arun and Ria are playing game by finding the number of ZEROs and ONEs in the given input. This input contains 'ZEROs and ONEs' only. If the given input contains only ZEROs (or) Only ONEs then print the statement 'YES' otherwise print the statement 'NO'.</p> <pre> #include &lt;stdio.h&gt; #include &lt;string.h&gt; int main() { int T,n1,n0,len,i; char str[100002]; scanf("%d",&amp;T); while(T--) { scanf("%s",str); n1=n0=0; len=strlen(str); for(i=0;i&lt;len;i++) { if(str[i]=='0') ++n0; else ++n1; } if(n1==len    n0==len) { printf("YES\n"); } else{ printf("NO\n"); } } return 0; } </pre>	5	2	3	1	2.1.3
----	---	---	---	---	---	-------

13	<p>Sajid is a graduate student he applied to a BPO company but he does not get typing fast. So he wanted to increase his typing speed for the job.</p> <p>His well-wisher suggested that he type the sentence "The quick brown fox jumps over the lazy dog" repeatedly. This sentence is known as a pangram because it contains every letter of the alphabet.</p> <p>After typing the sentence several times, Sajid needs to check whether the given number is a pangram. can you help him, whether the given sentence is a pangram or not</p> <pre>#include &lt;stdio.h&gt; #include &lt;stdlib.h&gt; #include &lt;string.h&gt; void findpan(); int main() { char str[50]; fgets(str,50,stdin); findpan(str); return 0; } void findpan(char arr[]) { int count[26]={0}; int i,n=strlen(arr); for(i=0;i&lt;n;i++) count[arr[i]-'a']=1; for(i=0;i&lt;26;i++) if(count[i]==0) break; if(i==26) printf("panagram"); else printf("not a panagram"); }</pre>	5	3	3	1	2.1.3
----	---	---	---	---	---	-------

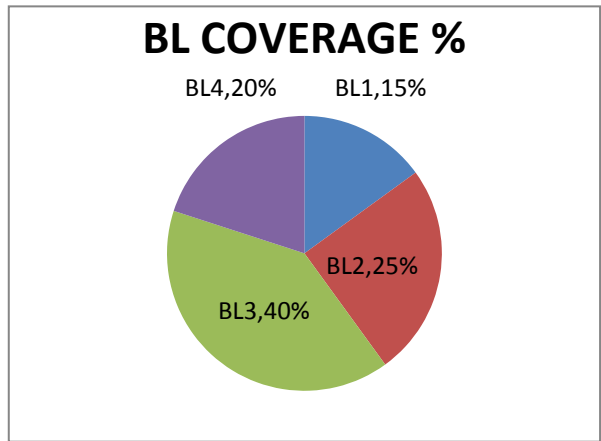
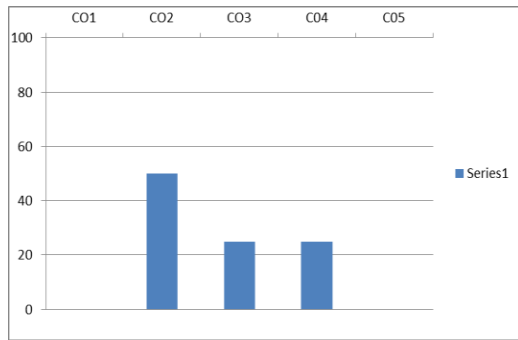
14	<p>Janu and Ram are close friends who task a lot about life. They go though a lot of inspiring "Quotes of Life".One fine day they had a small game. According to the game Ram will Read one of the Quote about life from the book and Jannu have to think a word about life in her mind without disclosing it to Ram.Finally once Ram completed reading the quoted Jannu will say if the word she thought in her mind is there in the Quote read by Ram.Can you convert the same scenario to a programming logic ?If the work thought by Jannu was present in the Quote then you have to print "Exists" else print "Dosen't Exists"..</p> <pre> #include &lt;stdio.h&gt; #include &lt;string.h&gt; int M,N,i,j,res; int main() { int t; scanf("%d",&amp;t); while(t--) { char string[100]; char p[100]; scanf("%s%s",string,p); M=strlen(p); N=strlen(string); res=0; for(i=0;i&lt;=N-M;i++) { for(j=0;j&lt;M;j++) if(string[i+j]!=p[j]) break; if(j==M) { res++; j=0; } } if(res&gt;0) printf("Exists\n"); else printf("Dosen't Exists\n"); } return 0; } </pre>	5	3	3	1	2.1.3
----	---	---	---	---	---	-------

15	<p>Jimmy and Jill are playing a string game. Jack has given Jill one string X. Jill has to give some characters to Jimmy, so he wants to display elements AB from string X. Jill needs help to do this task. He wants a program to do this as he is lazy. For example, if you consider input string X as ABFINALAB and your <b>Output String Y is ABAB.</b></p> <pre>#include &lt;stdio.h&gt; int main(void) {     char str[] = "ABFINALAB";     char outstr[strlen(str)+1];     int i = 0, k = 0;     while (str[i])     {         if (str[i] == 'B'    str[i] == 'A')         {             outstr[k++] = str[i];         }         i++;     }     outstr[k] = '\0';     printf("The string with only A's and B's is %s", outstr);     return 0; }</pre>	5	3	3	1	2.1.3
OR						
16	<p>There are n steps in a staircase. Write a C program using the two functions which reads the number of stair cases taken by the person as n and computes and prints all the ways to reach the top level from ground level (step 0). (Assumed that person can climb only one or two steps at a time)</p> <pre>#include &lt;stdio.h&gt; int calc(int n); int count(int x);  int main () {     int n ;     printf("Enter number of stairs : ");     scanf("%d", &amp;n);     printf("Number of ways = %d", calc(n));     getchar();     return 0; } int calc(int n) {     if (n &lt;= 1)         return n;     return calc(n-1) + calc(n-2); }</pre>	5	2	4	1	2.1.3

17	<p>Netflix announced a one-year subscription offer for technical students. It will provide two numbers for the addition using call by reference. If the answer is correct for this question, you will get the offer. Can you complete the task to win this competition?</p> <pre>#include &lt;stdio.h&gt;  int addTwoNumbers(int *n1,int *n2){return(*n1+*n2);}  int main()  {  int *ptr ,  *qtr, first, second;  scanf("%d%d", &amp;first, &amp;second);  printf("%d", addTwoNumbers(&amp;first, &amp;second));  return(0);  }</pre>	5	2	4	1	2.1.3
18	<p>Amal has given an array <math>a_1, a_2, \dots, a_n</math> to Abdul. Write a Program to print whether the array is pairwise distinct using function concepts</p> <pre>#include &lt;stdio.h&gt;  int isDistinct(char* a, int sz) { for(int i = 0; i &lt; sz - 1; i++) for(int j = i+1; j &lt; sz; j++) if(a[i] == a[j]) return(0); return(1); }  int main() { int i, n; printf("Enter size of array:"); scanf("%d", &amp;n); int a[n]; for(i = 0; i &lt; n; i++) scanf("%d", &amp;a[i]); int check = isDistinct(a, n); if(check) printf("Distinct\n"); else printf("Not distinct\n"); }</pre>	5	3	4	1	2.1.3

19	<p>Sameer wants a number plate for his Brand new luxury bike. He likes it to be unrepeatable.</p> <p>He came through a display board about the Fibonacci series. He wants to check whether the number he wants to use for his bike comes in the Fibonacci series or not.</p> <p>Can you help him with a program which checks if a number is present in the Fibonacci series or not using a function.</p> <p>Fibonacci Series example:0 1 2 3 5 8.....that means initial values are 0 and 1 next value will be calculated by adding previous two values and so on..</p> <pre>#include &lt;stdio.h&gt; #include&lt;math.h&gt; int isPerfectSquare(long x) {     int s=(int)sqrt(x);     return(s*s ==x); } int isFibonacci(int x) {     return isPerfectSquare(5*x*x+4)    isPerfectSquare(5*x*x-4); } int main() {int n; scanf("%d",&amp;n); if(isFibonacci(n)) {     printf("YES"); } else printf("NO"); return 0; }</pre>	5	3	4	1	2.1.3
20	<p>Arif and Selvan both are friends. Both are planning to utilize the vacation holidays by learning a programming language. They learned the concept of the pointer and want to know the knowledge level. So they decided to make a coding test for each other. Arif wrote a string in the paper. Selvan wants to identify the total length of the input. Can you help Selvan by writing a program with the help of function and pointer concept without using predefined string functions?</p> <pre>#include &lt;stdio.h&gt; #include &lt;string.h&gt; int calculateLength(char* ch){     for(int i = 0; ch[i] != '\0'; i++);     return i; } int main() {     char a[151];     scanf("%s",a);     printf("%d",calculateLength(a));     return 0; }</pre>	5	3	4	1	2.1.3

**\*Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**  
**Course Outcome (CO) and Bloom's level (BL) Coverage in Questions**



**Approved by the Audit Professor/Course Coordinator**