Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology			
Program	B.Tech.(EE, CE,CSE)	**Semester**	2nd
Subject Code	ESC-104	**Subject Title**	PPS
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Er.Goldendeep Kaur,Er.Kuljeet Kaur,Er.Ranjodh Kaur Er. Jaswant Singh, Er.Sidharth Jain
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	31 March, 2023	**Roll Number**	2210053

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks

Q1	Write the output of the following code:
	`#include<stdio.h>`
	`int main( )`
	`{`
	`int marks=24;`
	`if (marks = = 24)`
	`if (0)`
	`printf ( " Pass ");`
	`else`
	`printf( " Fail ");`
	`}`
		CO4, L5	2

Q2	Draw a neat diagram to explain the components of computer system.	CO1, L2	2
Q3	Compare Flow chart , algorithm and pseudo code with example.	CO1, L4	4
Q4	a) Write the steps of compiling and executing a C code. b) Compare syntax error with logical error.	CO3, L4	4
Q5.	Write a code to print the following pattern. 1 1 2 1 2 3 1 2 3 4 1 2 3 1 2 1	CO4, L6	4
Q6	a) Write a code to execute Assignment operators and Relational operators. b) Discuss 1D and 2D arrays. Compare **char name** and **char name [4]** with example.	CO4, L6, L2	8

Course Outcomes (CO) *Students will be able to*

1	To formulate simple algorithm for arithmetic and logical problems
2	To translate the algorithms to program(in c languages)
3	To test and execute the programs and correct syntax and logical errors
4	To implement conditional branching, iteration and recursion.
5	To decompose a problem into function and synthesize a complete program using divide and conquer approach.
6	To use array, pointer and structure to formulate algorithms and programs
7	To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
8	To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

Code cannot be run & execute

(a)

1
1 2
1 2 3
1 2 3 4

diagrammical

MST-2

Guru Nanak Dev Engineering College, Ludhiana			
Department of Computer Science and Engineering and Information Technology			
Program	B.Tech.(ME,ECE,IT)	**Semester**	1st
Subject Code	ESC-104	**Subject Title**	PPS
Mid Semester Test (MST) No.	2	**Course Coordinator(s)**	Er,Goldendeep Kaur Er.Kuljit Kaur, Er.Meetali Er.Ranjodh Kaur Er.Sidharth Jain Er. Navdeep Kaur
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	23 Dec, 2022	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks
Q1	Differentiate between linear and binary search.	CO7, L2	2
Q2	Define Pointer. Write a program to add 2 numbers using pointer	CO6, L6	2

Q3	a) Complete the following code or correct the following code if something missing.
	struct time
	{
	int hrs=10;
	int mts=20;
	int secs=35;
	}t1,t2,t3;
	How structures are different from an array?
	b) Write a program in C to calculate the sum of numbers from 1 to n using recursion.
		CO6, CO4, L6	4

Q4	Write a program to demonstrate the concept of call by reference and call by value along with explanation.	CO5, L3	4
Q5	Solve the following list of elements using bubble and selection sort. **55, 66, 33, 22, 77, 11, 88, 12**	CO7, L2	4
Q6	Explain the different types of functions with suitable examples.	CO5, L4	8

Course Outcomes (CO)

Students will be able to

1	To formulate simple algorithm for arithmetic and logical problems
2	To translate the algorithms to program(in c languages)
3	To test and execute the programs and correct syntax and logical errors
4	To implement conditional branching, iteration and recursion.
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6	To use array, pointer and structure to formulate algorithms and programs
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RBT Classification	**Lower Order Thinking Levels (LOTS)**			**Higher Order Thinking Levels (HOTS)**		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

MST-1

Guru Nanak Dev Engineering College, Ludhiana			
Department of Information Technology and Computer Science			
Program	B.Tech.(IT, CSE, ECE)	**Semester**	1st
Subject Code	ESC-104	**Subject Title**	PPS
Mid Semester Test (MST) No.	1	**Course Coordinator(s)**	Er,Goldendeep Kaur Er.Kuljeet Kaur, Er.Navdeep Kaur Er.Ranjodh Kaur, Er.Mitali Er.Sidharth Jain
Max. Marks	24	**Time Duration**	1 hour 30 minutes
Date of MST	Nov 2022	**Roll Number**	

Note: Attempt all questions

Q. No.	Question	COs, RBT level	Marks

Q1	**a) What will be the output of the following code.**
	int main( ) {
	int m[ ] = {25, 50, 75, 100};
	m[0] = 33;
	printf("%d", m[1]);
	return 0;
	}
	b) Use strcpy and strcat function of strings.
		CO4, L5	2

Q2	**What will be the output?**
	#include <stdio.h>
	int main() {
	int day = 4;
	switch (day) {
	case 1:
	printf("Monday");
	break;
	case 2:
	printf("Tuesday");
	break;
	case 3:
	printf("Wednesday");
	case 4:
	printf("Thursday ");
	case 5:
	printf("Friday");
	break;
	case 6:
	printf("Saturday");
	break;
	case 7:
	printf("Sunday");
	break;
	}
	return 0;
	}
	b) What will be the output to evaluate 5 + 5 – 4 / 2 – 2 according to precedence in C?
		CO4, L5	2

Q3	a) Draw a neat diagram of computer system and discuss its each component. b) Draw a flow chart for finding greatest among 3 numbers.	CO1, L1	4
Q4	List the types of operating system and discuss the functions of an operating system.	CO1, L2	4

Q5	**a) Write a code to print the following pattern using any loop.**
	* * * *
	* * *
	* *
	*
	b) Convert the following code into for-loop and give its output,
	#include <stdio.h>
	int main( ) {
	int i = 0;
	do {
	printf("%d\n", i);
	i++;
	}
	while (i < 5);
	return 0;
	}
		CO4, L6	4

Q6.	a) Discuss the types of errors with example. b) Write the Four Stages of Compiling a C Program to object and executable code.	CO3, L2	8

Course Outcomes (CO) *Students will be able to*

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2	To translate the algorithms to program(in c languages)
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RBT Classification	Lower Order Thinking Levels (LOTS)			Higher Order Thinking Levels (HOTS)		
RBT Level Number	L1	L2	L3	L4	L5	L6
RBT Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

2217063

Please check that this question paper contains 9 questions and 3 printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 3]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 1st/2nd
Name of Subject: Programming for Problem Solving
Subject Code: ESC-104
Paper ID: 15935
Scientific calculator is Not Allowed

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Define an algorithm and list the various desirable characteristics of a good algorithm.

b) When the if statement does not have an associated else, explain what happens when the condition evaluates to zero with a suitable example.

c) Write and explain the output of the following program with steps.

```
#include<stdio.h>
int f(int n, int k)
{
if(n==0) return 0;
else if(n%2) return f(n/2,
2*k)+k;
else return f(n/2, 2*k)-k;
}
int main()
{
printf("%d",f(20,1));
return 0;
}
```

d) The elements of an array are given as 12,7,13,9,10,77,2,8. Identify and write the arrangement of elements after the first pass of the bubble sort method.

P.T.O.

e) Is it possible to declare more than one array in the same declaration statement? Justify your answer.

f) By analysing the following program, determine the output? and explain your answer.

```
#include <stdio.h>
int main() {
    int i;
    for(i=0;i<5;i++)
    {int j=3;
    printf("%d",i*j);
    }
    printf("%d",j);
    return 0;
}
```

Part – B **[Marks: 04 each]**

Q2. Demonstrate the concept of break and continue statement with a suitable example.

Q3. Define a function. List the various advantages of using functions. List and explain various string functions by making use of suitable examples.

Q4. What is a pointer? How a pointer is declared. Explain with an example, how a variable is accessed using a pointer.

Q5. Define flowchart. Construct a flowchart and write an algorithm to find the largest digit in a natural number 'n'.

Q6. Distinguish between searching and sorting. Explain binary search by taking a suitable example to demonstrate its concept.

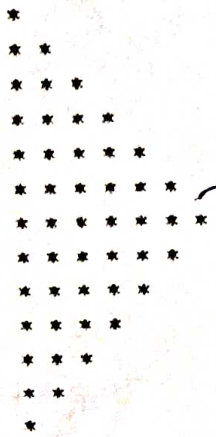
Q7. Develop a program that accepts an array, interchanges the first element with the last element, the second element with the second last element, and so on, and finally prints the new array.

P.T.O.

Part – C

[Marks: 12 each]

Q8. Construct a program to make the following pattern using for **and** while loop and the output of your program must exactly match the pattern given below. **Note:** make two different programs for this one using FOR loop and another using WHILE loop.



OR

Write an algorithm for Insertion and linear search. Also, explain both using a suitable example.

Q9. Explain the need of recursion in C.What do you mean by base case in recursion, explain by taking a suitable example. Further, write a program in C to print the factorial of a number 'n'.

OR

Define a structure. Explain the main reason for using structures. Design a structure named student to store the data about a student which contains the following elements- rollno, name and score. Write a program to input the data about students, and output the stored data.

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Please check that this question paper contains 9 questions and 3 printed pages within first ten minutes.

[Total No. of Questions: 09] [Total No. of Pages: 3]

Uni. Roll No. .....

Program: B.Tech. (Batch 2018 onward)
Semester: 2
Name of Subject: Programming for Problem Solving
Subject Code: ESC-104
Paper ID: 15935

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately

Part – A **[Marks: 02 each]**

Q1.

a) Describe Operating System. List the various functions of the operating system.

b) Discuss Syntax and logical errors.

c) Explain the use of scanf statement.

d) How to initialize a structure. Give an example.

e) Analyze the program given below and write and explain the output.

```
# include <stdio.h>
void fun(int x)
{
   x = 30;
}
int main()
{
 int y = 20;
 fun(y);
 printf("%d", y);
 return 0;
}
```


P.T.O.

f) Determine the output of the following program? and explain your answer.

```
# include <stdio.h>
void fun(int *ptr)
{
   *ptr = 30;
}
int main()
{
 int y = 20;
 fun(&y);
 printf("%d", y);
 return 0;
}
```

Part – B **[Marks: 04 each]**

Q2. Define flowchart. Construct a flowchart and write an algorithm to compute the volume of a sphere. Use the formula: V = (4/3) *pi*r3 where pi is equal to 3.1416 approximately. The r is the radius of the sphere. Display the result.

Q3. Define structure and explain the concept of array of structures in detail.

Q4. Define pointers? Demonstrate the working of a pointer with the help of a suitable example.

Q5. What are functions? List types of user defined functions with suitable examples.

Q6. Explain various conditional branching statements in detail.

Q7. Distinguish between searching and sorting. Explain any sorting algorithm by taking a suitable example.

Part – C **[Marks: 12 each]**

Q8. Illustrate the need of recursion in C. Write a program in C to print the first 50 natural numbers using recursion.

OR

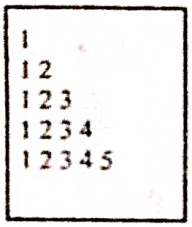
Write an algorithm for Selection sort and explain taking a suitable example.

Q9. Define an array. Differentiate between 1-D and 2-D arrays. Create a Program to find the second largest & smallest elements in an array.

OR

Differentiate between while and do while loop, also write the syntax for '**FOR**' loop.

Create a program to make a pyramid pattern using numbers and the Output of your program must exactly match the below given.



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Please check that this question paper contains 9 questions and 3 printed pages within first ten minutes.

[Total No. of Questions: 09] 2203717
Uni. Roll No. ..

[Total No. of Pages: 3]

Program: B.Tech. (Batch 2018 onward)
Semester: 1ST /2ND
Name of Subject: Programming for Problem Solving
Subject Code: ESC-104
Paper ID: 15935
Scientific calculator is Not Allowed

Time Allowed: 03 Hours **Max. Marks: 60**

NOTE:

1) Parts A and B are compulsory
2) Part-C has Two Questions Q8 and Q9. Both are compulsory, but with internal choice
3) Any missing data may be assumed appropriately. For programs, it is expected that suitable assumptions are made and stated wherever micro-level requirement related to the code to be developed is not mentioned.

Part – A **[Marks: 02 each]**

Q1 10

a) Differentiate between algorithm and pseudocode

b) Justify quoted text with example, "A pointer stores the memory address of a variable".

c) How many passes does a Bubble sort algorithm require for sorting a given list of 'n' items? Give example.

d) Differentiate between semantic and logical errors.

e) Is it possible to declare more than one array in the same declaration statement? Justify you answer.

f) What will be the output of following code?

```
int main ( )
{
int i,j;
for(i=2;i<=4;i++)
  {
  for(j=2;j<=4;j++)
    {
    if(++i ==3 || --j==3)
      {
       continue;
      }
    printf(" %d",i);
    printf(" %d",j);
    if(++i==5 || --j==4)
      {
      break;
      }
    }
  }
printf(" %d",i);
printf(" %d",j);
return 0;
}
```

Part – B **[Marks: 04 each]**

Q2 With the help of block-diagram, explain components of computer system.

Q3 Write steps for conversion of source code to executable code with the help of a diagram.

Q4 Explain recursion with the help of an example.

Q5 Create a user-defined function to find the sum of digits of any positive integer number read through the keyboard. Make use of parameter passing and return type concepts.

Q6 Construct a flowchart and write an algorithm to find how many times the digit 'D' appears in the number 'N'.

Q7 Develop a code that accepts an array, interchanges the first element with the last element, the second element with the second last element, and so on, and finally prints the new array.

Part – C

[Marks: 12 each]

Q8 Explain selection and insertion sort algorithms. Also implement the same.

OR

Write a program to multiply two 2-D arrays.

Q9 Develop a menu driven code that does the following:

If 'A' is entered, user-defined function **'isPalindrome'** must be able find whether number entered by user is palindrome or not.

If 'B' is entered, user-defined function **'add'** must be able to add positive two numbers which are read through the keyboard.

If any other 'character' is entered, code must be able to terminate with a suitable message.

[Make use of parameter passing and return type concepts while developing code.]

OR

Create a structure **'Student'** that contains the fields like: **studentID, name, age,** and **marks.** Write a program that allows the user to perform the following tasks:

Input student details (ID, name, age, marks) for **'n'** students (where **'n'** is read through the keyboard).

Display the details of all students in the record.

Find and display details of student who has highest marks.

In your program, make use of an array of structures and functions.

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