



**School of Electronics Engineering
CONTINUOUS ASSESSMENT TEST - 1
Fall SEMESTER 2055-2056**

Slot: E2+TE2

Programme Name & Branch	: M. Tech (Embedded Systems)
Course Code and Course Name	: MAEDS503 – Embedded Programming
Faculty Name(s)	: Dr. Shanmugasundaram M
Class Number(s)	: VL2025260105659
Date of Examination	: 21/8/25
Exam Duration	: 90 minutes
	Maximum Marks: 50

General instruction(s):

CO1. Apply the fundamental concepts of C programming and data structures to solve basic computational problems.

Answer ALL Questions

Q. No	Question	M	CO	BL
1.	<p>Analyze the following codes.</p> <p>(i)</p> <pre>#include<stdio.h> int main(){ double num=5.2; int var=5; printf("%d\t",sizeof(!num)); = 4 printf("%d\t",sizeof(var=15/2)); → (1) %d = 4 printf("%d",var); = 5 return 0; }</pre> <p>(ii)</p> <pre>#include <stdio.h> int main(){ int a, b=5, c= 1, d=4 , e=2; a=b++ - ++c *d/e; printf("%d", a); return 0; }</pre> <p>(iii)</p> <pre>#include<stdio.h> int main(){ int i=5, j; j=++i++ + i++ + i; printf("%d %d",i,j); return 0; }</pre> <p>(iv)</p> <pre>#include<stdio.h> int fun(int i){ return (i++); } int main() {</pre> <p><i>!num = 0 size of (int) f not executed 5 - 2 * 4 / 2 ① Syntax error space & unde fined conceal based compile i=5 j= 6 + 7 + 8 = 21 post increment 10 is returned</i></p>	10	1	3

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School of Electronics Engineering
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Fall SEMESTER 2055-2056**Slot: E2+TE2**

	<pre>int fun(int), i = fun(10); i=0 printf("%d\n", --i); => -10 ~ 9 return 0; }</pre>			
2.	(i) Write a C program with a flowchart for displaying the following pattern given below	5	1	3
	<pre> 1 2 3 2 3 4 5 4 3 4 5 6 7 6 5 4 5 6 7 8 9 8 7 6 5</pre>			
	(ii) Write a C program to display the Armstrong numbers between two intervals.	5		
3.	(i). Write a C program for the given scenario. Get three integer values from the user. Do the cyclic swapping among those three numbers using call by reference without using the fourth variable? Example: Get three integers from the user in a,b,c. Swap the value from a to b, b to c, and c to a. (ii). Write a c program, which asks the user to enter five names, stores them in an array, and then prints the names along with their lengths using functional call.	5	1	2
4.	Write a C program to Find the Second Biggest element in the list of 10 elements using passing array to function concepts.	5	1	3
5.	Write a C program with flow chart to find the presence of an element in a list of array pointers. Input: 11, 22, 33, 44, 55, 66, 77, 88, 99 Element to be searched: 77	10	1	3



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School of Electronics Engineering
CONTINUOUS ASSESSMENT TEST - 2
Fall SEMESTER 2055-2056

Slot: E2+TE2

Programme Name & Branch
Course Code and Course Name
Faculty Name(s)
Class Number(s)
Date of Examination
Exam Duration
General instruction(s):

: M. Tech (Embedded Systems)
: MAEDS503 – Embedded Programming
: Dr. Shanmugasundaram M
: VL2025260105659
: 10/10/25
: 90 minutes

Maximum Marks: 50

CO1. Apply the fundamental concepts of C programming and data structures to solve basic computational problems.

Answer ALL Questions

Q. No	Question	M	CO	BL
1.	<p>a) Debug and correct following program so that it should display the factorial a number using pointers</p> <pre>#include<stdio.h> int main() { int i, factorial, num=5, a=1; *factorial = &a; for(i=1, i<num, i++) factorial=factorial*i; printf("Factorial of %d is: %p", num, factorial); return 0; }</pre> <p><i>int *factorial factorial = &a *factorial = factorial * i</i></p>	5	1	3
	<p>b) Debug and correct following program so that it should display GCD of the given numbers using function call.</p> <pre>#include <stdio.h> int gcd(a, b) { if (b == 1) return b; else { c=b; d=a/b; return gcd(c, d); } int main() { int num1= 6, num2=8; printf("GCD is %d ", gcd(num1)); return 0; }</pre> <p><i>gcd (a,b) if (b=0) return (b, a+b); else return a;</i></p>	5		
2.	<p>Analyse the following codes</p> <p>(i)</p> <pre>#include <stdio.h> void main() { int a[] = {1,2,3,4,5}, *p; p = a; ++*p; printf("%d ", *p); p += 2; printf("%d ", *p); }</pre> <p><i>p = a[0] = 1 + p = a[0] = 1 => 2 p += 2 = a[2] = 3 *p = 3 { 2, 2, 3, 4, 5 }</i></p> <p>(ii)</p> <pre>#include <stdio.h></pre>	10	1	4



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School of Electronics Engineering
CONTINUOUS ASSESSMENT TEST - 2
Fall SEMESTER 2055-2056

Slot: E2+TE2

```
void main() {
    int *a, **b;
    char *c;
    printf("%d\n %d\n %d", sizeof(a), sizeof(b), sizeof(c)); → 8 8, 8
}
```

(iii)

```
#include <stdio.h>
void m(int *b, int *a) {
    int c = *a; *a = *b; *b = c;
}
void main() {
    int a = 6, b = 5;
    m(&a, &b);
    printf("%d %d\n", a, b); } ← 5 - 6
```

(iv)

```
#include <stdio.h>
void main() {
    int A[] = {1, 2, 3, 4}, a = 1, *p;
    p = A + 1;
    printf("%d %d %d ", p[a], p[a + 1], p[a - 1]);
}
```

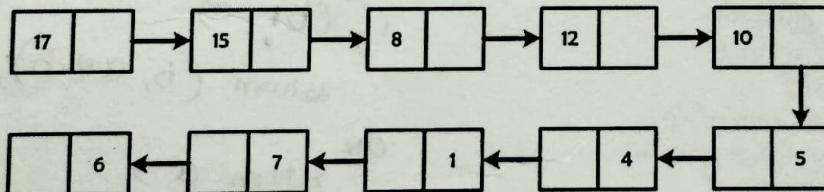
$$\begin{aligned} p &= A[1] \\ p[1] &= A[2] = 3 \\ p[2] &= A[3] = 4 \\ p[0] &= A[1] = 2 \end{aligned}$$

3.

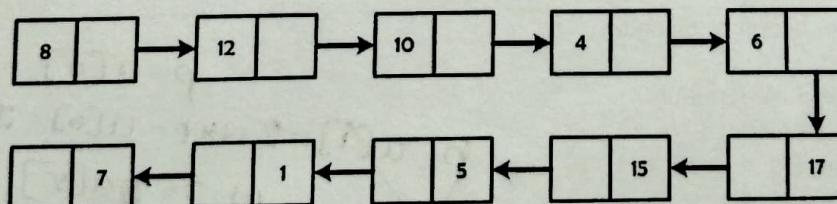
Write a suitable C code to modify the given linked list of integers as shown in input so that all even numbers appear before all odd numbers in the modified linked list as in output. Also, keep the even and odd numbers in the same order.

Example:

Input:



Output:



4.

Given a 2-D matrix. You need to convert it into a linked list matrix such that each node is linked to its next right and down node and display it. Write a suitable C code for the above scenario.

Example:

10 1 3

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MALPRACTICE
- DON'T WRITE AN'

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School of Electronics Engineering
CONTINUOUS ASSESSMENT TEST - 2
Fall SEMESTER 2055-2056

Slot: E2 + TE2

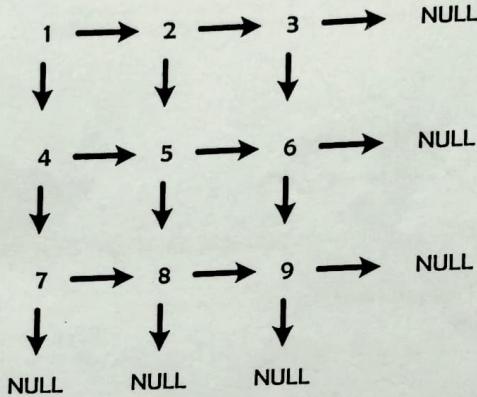
Input: 2D Matrix

1 2 3

4 5 6

7 8 9

Output



5. You are given head of the non-empty sorted single linked list where the value of the i^{th} node will be A_i . Your task is to delete all duplicates such that each element appears only once and return the linked list sorted. Write a suitable C code for the above scenario.

10 1 3



Final Assessment Test - November 2025

Course: MAEDS503 - Embedded Programming

Class NBR(s): 5659

Slot: E2+TE2

Time: Three Hours

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

COs	CO Statements
CO1	Apply the fundamental concepts of C programming and data structures to solve basic computational problems.
CO2	Apply knowledge of Linux basics in SHELL programming.
CO3	Analyze the components of embedded Linux systems to understand their roles and interactions.
CO4	Apply kernel module programming techniques to develop and test basic device driver programs.
CO5	Design and implement embedded and Linux-based development environments using state-of-the-art hardware and software tools.

BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)

**Answer ALL Questions
(10 X 10 = 100 Marks)**

1. Analyse the following codes by determining the output of print statements and justify your answer:

CO1 BL5

(i) # include <studio.h>

```
int main()
{
    char s[]={'a','b','c','\n','c','\0'};
    char *p,*str,*str1;
    p=&s[3];
    str=p;
    str1=s;
    printf("%c",++*p + ***str1-3);
    return 0;
}
```

(ii).

```
# include <studio.h>

int main()
{
    int const *q = 2;
    printf("Output: %d\n",++(*q));
    return 0;
}
```

(iii).

```
#include<stdio.h>
int main(){
    int a=2,b=7,c=10;
    c=a==b;
    printf("%d",c);
    return 0;
}
```

(iv).

```
# include <studio.h>

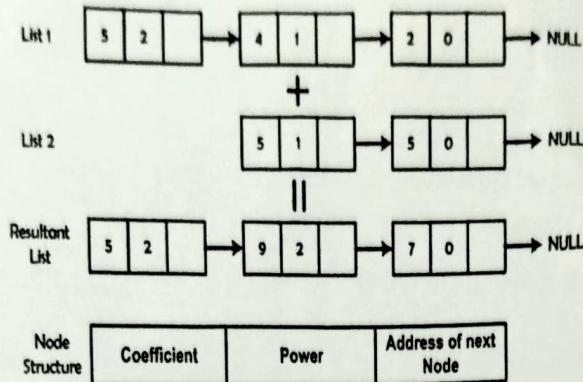
void main()
{
    int i = 0, j = 0;
    for (i = 0; i < 5; i++)
    {
        for (j = 0; j < 1;
        {
            break;
        }
        printf("Embedded \n");
    }
}
```

2. a) Develop a C program and corresponding flowchart to display the specified [5] CO1 BL3 pattern as shown below.

1	2	3	4	5
1				5
1				5
1				5
1	2	3	4	5

- b) Compare and contrast the functionalities of the *break* and *continue* statements in C programming. Illustrate your answer with appropriate C code examples and a flowchart to demonstrate their control flow differences. [5]

- 3.(a) Given two polynomial expressions represented by linked lists. You need to write a function that adds these lists, that is, adds the coefficients that have the same variable powers. CO1 BL3



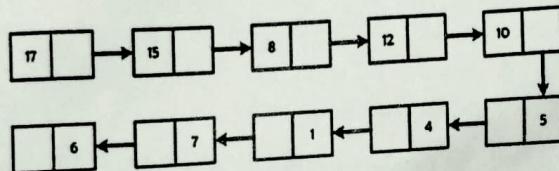
OR

- 3.(b) Design and implement a C program to rearrange a given linked list of integers such that all even numbers appear before all odd numbers, while preserving their original relative order. Illustrate your solution with suitable C code and explain the logic used for the modification.

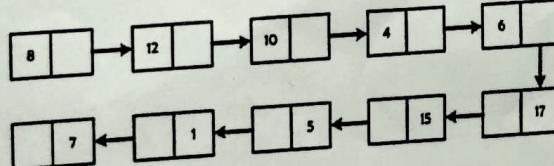
CO1 BL3

Example:

Input:



Output:



- 4.
- (i) Identify the shell commands for the following operation
- Cut a section of a file and print the result to standard output.
 - Show the IP address of the system.
 - To append file contents to another file.
 - To show the path of the present working directory.
 - To display the contents of a file page by page.

CO2 BL3

(ii) Brief on following Linux Commands

- Ctrl + c
- ifconfig
- touch
- pwd
- more file.txt

- 5.(a) Develop a shell script and outline its algorithm to perform the following tasks:

CO2 BL3

- Read 10 numbers from the user.
- Separate the positive and negative numbers.
- Calculate the average of the positive numbers.
- Compute the sum of the negative numbers.

Input: 7, -4, -6, 8, 3, -4, 3, 5, 4, 9

OR

5.(b) Design a shell script along with its algorithm to perform the following operations: CO2 BL3

- (i) Accept an input string from the user.
- (ii) Using function calls, determine and display the count of vowels, consonants, and special characters present in the string.

6. a) Write a shell script for displaying the following pattern given below CO2 BL2

```
0  
1 0  
2 1 0  
3 2 1 0  
4 3 2 1 0
```

b) Write a shell script to count the number of integers in the given digit.

Input: 98765

7. a) Examine the *fork()* system call in Linux. Discuss how it creates new processes, differentiate between parent and child processes, and illustrate the process creation mechanism using a neat diagram. CO3 BL2

b) Compare and contrast the *getpid()* and *getppid()* system calls in Linux. Support your explanation with appropriate C code and a flowchart.

8. Describe the role of the *ioctl()* system call in Linux device drivers. Explain how it facilitates communication between user applications and device drivers. CO4 BL3

9. Analyze the procedure for implementing a character device driver in Linux. Explain each step in detail and illustrate the complete process using a well-labelled flowchart, highlighting how the driver interacts with the kernel and user space. CO4 BL3

10. a) Analyze the architectural differences between Monolithic and Microkernel operating systems. Discuss their advantages and disadvantages, and provide suitable examples to support your explanation. [5] CO5 BL3

b) Analyze the role of the Linux kernel in file and device management. Explain how it handles file operations, device I/O, and resource allocation, highlighting the interaction between user space and kernel space. Support your answer with relevant examples. [5]

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