

JK Lakshmipat University Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, May 2026

B. Tech. (All), Semester II

Roll No.....

CS1135: Programming II (C)

Time: 2 Hours 30 Minutes

Max. Marks: 30

Instructions to students:

1. Assume suitable data wherever required and mention it clearly.
2. **Answers written in pencil will not be considered for evaluation.**
3. **User input is mandatory. Do not use hardcoded values in any program.**
4. Use of a normal (non-programmable) calculator is permitted.

Q.1	What will be the Error/Output of the following C code snippets? All Programs are compiled and run in Linux GCC 64-bit compiler.	05 Marks
	I) <pre>#include <stdio.h> void fun(char arr[]) { printf("%lu ", sizeof(arr)); } int main() { char str[] = "hello"; printf("%lu ", sizeof(str)); fun(str); return -10; }</pre> II) <pre>#include <stdio.h> int main() {static int x = 3; x++; if (x <= 5) { printf("hi "); main(); } return 5; }</pre>	1 Mark each CO1, CO3, CO4
	III) <pre>#include<stdio.h> #define FALSE -1 #define TRUE 1 #define NULL 0 int main() { if(NULL) puts("NULL"); else if(FALSE) puts("TRUE"); else puts("FALSE"); return 2;}</pre> IV) <pre>#include <stdio.h> int main() { int a = 2, b = 6; int *p = &a; int **q = &p; int ***r = &q; printf("%d ", ***r); **q = b; printf("%d ", a); *q = &b; printf("%d ", ***r); printf("%d", b); return 4;}</pre>	
	V) #include<stdio.h> <pre>struct Item { int code; int price; }; void update(struct Item x) { x.code = 99; x.price += 50; }</pre> <pre>int main() { struct Item a = {10, 200}; update(a); printf("%d %d\n", a.code, a.price); return 5; }</pre>	

Q.2	A user can perform basic string compression by replacing consecutive repeated characters with the character followed by the number of its occurrences. For example, the string "aaabbcaa" should be compressed to "a3b2c1a2". Create a user-defined function that implements the logic of string compression and stores the resultant string in a different array. Your main function should take the input string from the user and print the original and the compressed string. Constraints that must be met: 1. Do not use any functions from the <string.h> library. 2. Assume the input string contains only lowercase English letters. 3. Your implementation should handle the conversion of the character count into its string representation (e.g., if a character appears 12 times, the output should contain ...c12...). 4. You must properly null-terminate the destination string. 5. No global variables are allowed Example: Input: src = aaabbcccdadaa Output: src = aaabbcccdadaa, dest = a3b2c4d1aa2	05 Marks CO4, CO2
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Q.3A	A hostel mess keeps a record for every student with the roll number, name, number of meals eaten in the month, cost per meal, total bill, and a receipt number (the last two are empty initially). Write a program that uses three functions to do the following: 1. Read the details of N students. The warden enters the first four fields for each student. 2. The first function fills in the bill and the receipt number for one student and is called once per student. Receipts run 1, 2, 3, ... in the order students are processed. The function decides the next receipt on its own by remembering what it gave last time — without taking the previous receipt as input, and without using any variable declared outside it. After it returns, both the bill and the receipt must be visible in main inside that student's record. 3. The second function finds the student with the highest bill. It must not return a copy. 4. The third function prints the details of the student with highest bill. It only reads the record, so it can work on a copy. Sample Input: <pre>3 101 Aman 25 80 102 Neha 28 80 103 Rohit 30 90</pre> Sample Output: <pre>Roll : 103 Name : Rohit Bill : 2700 Receipt : 3</pre>	03 Marks CO4, CO2
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Q.3B	The mess also stores each student's joining date. The warden wrote the following code that returns 1 if joining date d1 falls chronologically before d2, and 0 otherwise. <pre> struct Date { int day; int month; int year; }; int isBefore(struct Date d1, struct Date d2) { if (d1.year < d2.year) return 1; if (d1.month < d2.month) return 1; if (d1.day < d2.day) return 1; return 0; } </pre> Will this work for all the cases? Justify your answer with at least two examples.	02 Marks CO4, CO2
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Q.4	A grocery store calculates the bill amount based on the items purchased by a customer. The prices of the items are as follows: • Apples: Rs. 50 per kg. • Bananas: Rs. 40 per kg • Oranges: Rs. 60 per kg • Grapes: Rs. 80 per kg Write a C program to read the name of the customer, the quantities of each item purchased (in kg), and the store also charges a packing fee of Rs. 20 for every transaction. Define a function that calculates and returns the total bill amount, and another function to display the complete bill details including Name, Items with quantity and total amount.	05 Marks CO3, CO5
Q.5A	Write a C program that accepts the size and elements of two integer arrays, where the elements of each array are already arranged in ascending order. Compare the elements of both arrays and merge them into a third array so that the resulting array is also in ascending order. Finally, display all elements of the merged array. Implement above logic using pointers only (i.e., without using array indexing such as arr[i]). Note: Marks will be awarded if the complete program is implemented using pointers only.	03 Marks CO1

Q.5B	Consider the following C program that uses pointer arithmetic and increment/decrement operators. Predict the final output of the program by tracing the execution of each statement. Also explain how the pointer p changes its position after every printf() statement with proper justification.	02 Marks CO1
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#include <stdio.h>
int main()
{ int a[] = {2, 4, 6, 8, 10};
  int *p = a + 2;
  printf("%d ", *p--);
  printf("%d ", *++p + *p);
  printf("%d ", *(p + 2) - *p);
  printf("%d", *--p + *(p + 3));
  return 0;
}
```

Q.6A	A log file log.txt stores system activity. A new activity needs to be added without deleting existing data. Write a C program to append a new line of text entered by the user to the file and then display the updated content.	2.5 Marks CO1
Q.6B	A file numbers.txt contains integers. Write a C program to copy only even numbers into another file even.txt and odd numbers into odd.txt.	2.5 Marks CO1

*****All The Best*****