

Reg. No.

SAMPLE LAB EXAM



Indian Institute of Information Technology, Surat
Department of Computer Science & Engineering
End Semester Lab Examination, 1st Sem, 2025-26
Fundamentals of Computer and C Programming (CS101)

Timing: 11:00 AM to 1:00 PM

Date: TBD

Marks: 25

Instructions:

- Work on the computer assigned to you. You should log-in with the **exam** user whose details are given on the board.
- You will have **45 minutes** to code the solutions to both the problems.
- After 45 minutes, you must stop coding. **Do not modify** your code after this time.
- The remaining time will be used for a **viva** (oral examination). Lab instructors will evaluate your code and ask questions about your solution and related concepts.
- You will be graded on:
 - **Correctness:** Does the program work as specified? Does it handle all the edge cases? Code that does not compile at the end of 45 minutes will receive a **zero** for the 'correctness' portion.
 - **Adherence to instructions:** Does the program follow all instructions, such as writing functions with specified function prototypes or using specified structures? Does the program print appropriate user instructions and error messages?
 - **Best practices:** Code clarity, proper indentation, use of comments, and variable naming.
- Since we do not have an uninterrupted power supply, please save your work frequently.
- You may (and should!) carry pen and blank paper with you, but no other devices including phones, smartwatches, and calculators are allowed.
- You must write your solutions in C. You may include any library that is present on your system. Lab instructors will not debug or help compile your code.

1. Is Char a Hex Digit?

(10)

Write a program that takes a single character as input from the user. Write a function with prototype `int is_hex(char c)`; that returns `1` if the given character can be interpreted as a hexadecimal digit, ignoring the case. It should return `0` otherwise.

Print **YES** if this function returns `1` and **NO** otherwise.

E.g.: On input **a** you should output **YES**. On input **A** you should output **YES**. On input **+** you should output **NO**.

2. Hex to Decimal

(15)

Write a program that:

- Reads a string from the user. You may assume that the user will input at most **8** alphanumeric characters. (Only alphabet and digits. No signs like **+** or **-**.)
- If the input string can be case-insensitively interpreted as a valid hexadecimal number, print that number in base **10**. Otherwise, print **"NaN"** to indicate that input is not a number.
- You should write and use the following functions as subroutines:
 - `int is_hex(char c)`; from the above question to validate the input string
 - `unsigned int hex_to_dec_char(char c)`; that converts a hexadecimal character to an integer between **0** and **15** in base **10**
 - `unsigned int hex_to_dec_str(const char str[])` that converts a hexadecimal string to an unsigned integer between **0** and $2^{32}-1$ in base **10**.

E.g.: On input **0a**, you should output **10**. On input **C5101**, you should output **807169**.