**Department of Computer Science and Engineering**
**Winter Semester: 2024-25**
**CS4086E: System Programming Lab**

**gcc Practice Questions**

**Question 1**
Write a shell script that:
1. Takes a C file name as an argument.
2. Checks if the input file has a .c extension and exists in the current directory.
3. Compiles the file into an object file (.o), a preprocessed file (.i), and an assembly file (.s).
4. Creates an executable named final_exec.
5. Prints appropriate success/failure messages after each stage.

**Question 2**
Write a shell script that:
1. Accepts a list of C source files as arguments.
2. Checks if all files exist.
3. Compiles each file into object files (.o).
4. Links all object files into an executable named project_exec.
5. If a source file is modified after the object file is created, recompile only that source file.

**Question 3**
Write a script that accepts a C file and a compilation stage flag (-E, -S, -c) as inputs, then performs the corresponding stage using gcc.

**Question 4**
Write a script that:
1. Compiles a given C program through each stage of compilation (.i, .s, .o, and executable).
2. Logs all errors and warnings from each stage into a separate (compile.log) file.
3. Displays the number of warnings and errors after the compilation process.

**Question 5**
Write a script that compiles a C file (for ex., main.c), that uses a shared library (libarith.so), and links it to generate an executable. The libarith library implements the four arithmetic operations such as addition, subtraction, multiplication, and division.

**Instructions:**
1. Date of Submission: on or before 23, Jan.'25
2. Upload the scripts in the Eduserver as a compressed folder containing all the codes named individually.
3. Name of the file: FirstName_RollNo.rar