

Indian Institute of Technology Dharwad
Department of Computer Science & Engineering
Compilers Lab Assignment
Submission Deadline Date: 18/04/2025 (11:59 PM)

Max Marks: 20

Design a simplified operator precedence parser for arithmetic expressions containing the following operators $+$, $-$, $*$, $/$ and parentheses $(,)$. Operands are single digit integers only:(0-9). Define the operator precedence and associativity for the given operators and construct the operator precedence table. Implement a stack-based operator precedence parser that:

- Reads an input expression e.g.,($3+5*2-8/4$) and validate the syntax using the precedence table. [2]
- Simulates shift and reduce operations. [3]
- Shows the content of the stack and the remaining input at each step. [4]
- Outputs whether the expression is valid or not based on operator precedence parsing rules. [3]
- You must use two stacks: one for operators and another for operands/symbols (or a unified stack as used in classical operator precedence parsing). Handle conflicts (if any) using the precedence rules. Do not evaluate the expression just parse it and simulate shift/reduce operations. Display the parsing steps clearly in tabular form ([**Stack**, **Input**, **Action**]).
- Viva and code explanation will contain 8 marks.