<u>III - S - M.Sc. - (Comp.Sc.) - CS - 3.3 -</u> (Compiler Design) - (R & B)

# 2024

Full Marks - 70

Time - As in the Programme

The figures in the right hand margin indicate marks. Answer ALL questions.

- 1.(a) Explain the various phases of the compiler in detail.
  Write the output of each phases of compiler for the expression c = a + b \* 12. [7
- (b) Write regular expression and design transition diagram for numbers. [7

### OR

- (c) Differentiate between compiler and interpreter.[4
- (d) Discuss the role of lexical analyzer in detail with necessary examples. [10
- 2.(a) Differentiate leftmost derivation and rightmost derivation. Show an example for each. [7
- (b) Write regular expressions and design transition diagrams for numbers and identifiers. [7

#### OR

(c) Discuss the input buffer schemes of the lexical analyzer.
 [7]
 [P.T.O...]

- (d) Define Ambiguous grammar ? Explain it with an example. [7
- 3.(a) Explain operator precedence parser and consider the following grammar : [14

E -> EOE | -E | (E) | id

O-> - | + | \* | / | ^

parse the input string "id1\*(id2+id3) - id4^id5" using operator precedence parsing.

# OR

- (b) Define symbol table. Explain about the data structures for the symbol table. [10
- (c) What are the common conflicts that can be encountered in shift reduce parsers ? Explain. [4
- 4.(a) What is the purpose of code optimization ? Explain in detail loop optimization with examples. [8]
  - (b) Construct the DAG and three address code for the expression a+a\*(b-c)+(b-c)\*d. [6]

# OR

- (c) What is a leader of the basic block ? Write and explain the algorithm used to find leaders. Draw flow graph for summation of 'n' numbers. [8]
- (d) Explain in brief about peephole optimization techniques. [6

- 5.(a) Explain various issues that crop up when designing a code generator. [7
- (b) What is usage count ? How to find out the usage count of a variable; explain with an example. [7

## OR

- (c) Explain simple code generation algorithm with an example. [7
- (d) Efficient Register allocation and assignment improves the performance of object code-Justify this statement with suitable examples. [7

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