

CS-701
B.E. VII Semester
Examination, December 2014
Compiler Design
Time : Three Hours
Maximum Marks : 70
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Note: i) Attempt one question from each unit.
ii) All questions carry equal marks.

Unit I

1. a) Explain the various phases of compiler? How phases of compilation converts the statement
 $\text{Position} = \text{initial} + \text{rate} * 60.$
- b) Briefly explain the compiler construction tools?
2. a) What are the issues in lexical analysis? Explain in detail the recognition of tokens.
- b) Design FA to accept the following:
 - i) Identifiers
 - ii) Constant

Unit - II

3. a) Explain handle pruning. Explain the same for the grammar $E \rightarrow E + E / E * E / (E) / \text{id}$ and input string $\text{id1} + \text{id2} * \text{id3}$.
- b) Describe the conflicts that may occur during shift reduce parsing.
4. a) Check whether the given grammar is LL(1) or not
$$S \rightarrow iEt SS' / a$$
$$S' \rightarrow eS / E$$
$$E \rightarrow b$$
- b) What is syntax directed translation? Why are they important?

Unit - III

5. a) Discuss the symbol table organisation, also give the difference between binary tree and hashing organisation of symbol table.
- b) Explain the various parameter parsing mechanism.
6. a) Explain the specification of simple type checker?
- b) What is polymorphic functions?
- c) How type checking and type conversion is implemented in compiler.

Unit - IV

7. a) Construct DAG for the following expression. $a + a * (b - c) + (b - c) * d$
- b) How CPU registers are allocated while creating machine code.
8. a) Write quadruples from the expression: $(a + b) * (c + d) - (a + b + c)$
- b) Discuss the issues in design of code generator.

Unit - V

- 9 a) What is global data analysis? What is its use in code optimization?
- b) Explain the following with example:
 - i) Strength reduction
 - ii) Variable propagation
 - iii) Common sub expression elimination
10. a) Explain loop optimization with example. b) Define the following
 - i) Dominators
 - ii) Natural loops
 - iii) Inner loop
 - iv) Preheader