

Code No: C5809

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech I - Semester Examinations March/April-2011

ADVANCED COMPILER DESIGN

(COMPUTER SCIENCE AND ENGINEERING)

Time: 3hours

Max.Marks:60

Answer any five questions
All questions carry equal marks

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1. What is type checking? Give one example for abstract syntax tree? Explain different intermediate code forms in detail. [12]
2. Write about run time memory organization, and explain using a suitable example how the scope information of block structured languages is represented in symbol table? [12]
3. Construct LALR (1) parsing table for the following grammar.
 $S \rightarrow Aa \mid bAc \mid dc \mid bda$
 $A \rightarrow d$ [12]
4. a) Explain the steps in BURS code generation.
 b) Generate code for the following basic block.
 $t1 = b + c$
 $t2 = d * e$
 $t3 = t2 * t1$
 $x = t3 * f$
 Assuming that two registers are available. [12]
5. What is the need of 'code optimization' in compiler design? Explain the following code optimization techniques with examples.
 i) Machine dependent & independent optimizations.
 ii) Local & Global optimizations. [12]
6. a) Construct DAG for the basic block whose code is given below.
 $t1 = b + c; t2 = d * e; t3 = t2 * t1; t3 = t3 * f; x = t1 - t3;$
 b) What are the different forms of object code? Explain the issues in code generation? [12]
7. Write short notes on any **three** of the following:
 a) Alias Analysis
 b) Loop Unrolling
 c) LEX
 d) LL (1) Grammars [12]
8. a) What are the differences between compilation and interpretation of languages.
 b) Write regular expressions and construct finite automata to recognize the following patterns.
 i) Strings over the alphabet $\{0,1\}$ and containing 101
 ii) To represent real numbers such as 454.65 where either part of the decimal point being optional. [12]
