III B.Tech II Semester Regular/Supplementary Examinations,May 2010
COMPILER DESIGN
Computer Science And Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Construct LALR parsing table for the following grammar
    $S-> CC$
    $C-> cC|d$

   (b) What do you mean by left most derivation. Explain with an example. [10+6]

2. Describe various phases of a compiler? Differentiate a phase and pass? Compare multipass and singlepass compiler? [16]

3. (a) Why are quadruples preferred over triples in an optimizing compiler. Explain

   (b) Give the triple representation of an array operation x : = y [i]

   (c) Give the syntax directed definition of if else statement. [8+4+4]

4. What is a basic block? With an example explain the procedure to identifying basic blocks in a given program. [16]

5. (a) Convert the following grammar into LL(1) grammar
    $S \to ABC$ $A \to a\,A|\,C$ $B \to b$ $C \to c$

   (b) construct LL(1) parse table for the above grammer.

   [8+8]

6. (a) Write about global register allocation strategy for loops.

   (b) Explain code generation from DAG. For the following instructions construct DAG.
    t_1:=a / b
    t2:=a/b
    t_3:=e - t_2
    t_4:=t_1 -t_3
    t_5:=e+t_2
    t_6:=t_4 * t_5. [8+8]

7. Explain symbol table organization using hash tables? Construct hash based structure for symbol table for the variable in the following program.
   int main()
   {
   int a1, a2, c1, c2;
   char b1;
   float d1, d2;
   —-

   ——

   }. [16]

8. Write the importance of global code optimization. Explain redundant sub expression elimination technique across different blocks with example   [16]

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