

Code No: C5809

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I - SEMESTER EXAMINATIONS APRIL/MAY-2012
ADVANCED COMPILER DESIGN
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3hours**Max.Marks:60**

Answer any five questions
All questions carry equal marks

- - -

- 1.a) With a neat diagram explain the various phases of compiler design. List out the various compiler writing tools you know.
- b) For the following source language statement. show the output of each of the stages of the compiler for the statement $P = I + R * 40$. Variables P, I and R of type float.
2. Define Ambiguity? Explain how ambiguity can be removed in the following grammar:
 $E \rightarrow + E / E - E / E * E / E \text{ Divide } E / E \wedge E | (E) / -E / id.$
- 3.a) Write semantic actions to the set of procedure.
 $S \rightarrow E \$$
 $E \rightarrow E + E$
 $E \rightarrow E * E$
 $E \rightarrow (E)$
 $E \rightarrow I$
 $I \rightarrow I \text{ digit}$
 $I \rightarrow \text{digit}.$
- b) Distinguish between parse tree and syntax tree.
- 4.a) Define FIRST and FOLLOW.
- b) Compute FIRST and FOLLOW to the grammar mentioned in Question no 3.
- 5.a) What are the various data structures used for symbol table construction and explain any one in detail.
- b) Let A be 10 by 20 array, with $low1 = low2 = 1$. Let $w = 4$. Draw annotated parse tree for the assignment statement $X := A[y, z]$. Give the sequence of three address statement generated.
- 6.a) Why do we need code optimization? Explain the principal sources of optimization.
- b) Discuss code generation algorithm. Explain various storage allocation strategies.
7. Discuss the following with example
 - a) Quadruples
 - b) Triples
 - c) Indirect Triples.
8. Write short note on
 - a) Context free grammars.
 - b) Storage allocation.
 - c) Syntax directed translation.
 - d) Loop optimization.