B.Tech III Year I Semester (R13) Supplementary Examinations June 2017
COMPILER DESIGN
(Computer Science & Engineering)

Time: 3 hours   Max. Marks: 70

PART - A
(Compulsory Question)
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1   Answer the following: (10 X 02 = 20 Marks)
  (a)   List any two compiler construction tools along with their use in compiler design.
  (b)   Write regular expression for generating identifiers and constants in C language.
  (c)   What is a syntax tree? Draw the syntax tree for the following statement.
          a = a+b*c+a*(b+c)
  (d)   Give an example for ambiguous grammar. Show that your grammar is ambiguous.
  (e)   Why are quadruples preferred over triples in an optimizing compiler?
  (f)   List out the motivations for back patching.
  (g)   What are the limitations of static allocation?
  (h)   What is a basic block? Give an example.
  (i)   Draw DAGs to represent that expressions $a[i] = a[i] * b[i]$ and $a[i] = \&a$.
  (j)   What is the use of algebraic identities in optimization of basic blocks?

PART - B
(Answer all five units, 5 X 10 = 50 Marks)
UNIT - I

2   Explain in detail about the phases of a compiler.

OR

3   (a)   What is the need for input buffering? Explain the concept of input buffering with an example.
  (b)   What is bootstrapping? Show its use in compiler design with an example.

UNIT - II

4   Construct SLR parsing table for the following grammar.
          $E \rightarrow E + T/T$ $T \rightarrow T * F/F$ $F \rightarrow (E)/a$
          Show the moves of the parser for parsing the string a*a+a.

OR

5   (a)   Describe the conflicts that may occur during shift reduce parsing.
  (b)   Briefly explain about YACC tool.

UNIT - III

6   (a)   Explain with an example, how to generate the intermediate code for the flow of control statements (for and while statements).
  (b)   Give the translation scheme for converting the assignment statement into three address code. Illustrate the translation with an example.

OR

7   (a)   Explain about the type expressions and the type equivalences in detail.
  (b)   Write a syntax directed translation for generating the post fix notation of given expression. Show the translation by taking an example.

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UNIT - IV

8   (a)   Describe about the access of non local names in stack storage.

    (b)   Explain about loop optimization with an example.

OR

9   (a)   Write in brief about garbage collection.

    (b)   Define scope and life time of variables. Give examples for each. Discuss the importance of both in storage allocation.

UNIT - V

10   Explain in detail about register allocation and assignment.

OR

11 (a)   Explain about various issues in code generation.

    (b)   Discuss the use of DAGs in code generation.

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