R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year I Semester Examinations, February/March - 2016
COMPILER DESIGN
(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

Part- A

(25 Marks)

1.a) Define Boot strapping. [2]
b) What is Context free grammar? [3]
c) Ware the actions performed by Shift reduce parser? [2]
d) Describe in brief about types of LR parser? [3]
e) What is type expression? [2]
f) Define Type Equivalence? [3]
g) Define Basic Block? [2]
h) How can you identify the leader in a Basic block? [3]
i) Which graph is used for identifying the common sub expression in an expression? [2]
j) What is meant register allocation and assignment? [3]

Part-B

(50 Marks)

2.a) Define Regular Expression? Explain about the Properties of Regular Expressions.
b) Differentiate between Top down and bottom up parsing techniques. [5+5]

OR

3.a) Define Compiler? Explain in brief about the syntax and semantic analysis of a compiler with an example?
b) Construct a Predictive parsing table for the Grammar [5+5]
$E \rightarrow E+T/T, \quad T \rightarrow T*F/F, \quad F \rightarrow (E)/id$.

4.a) Construct SLR parsing table for the following grammar.
$E \rightarrow E+T/T \quad T \rightarrow T*F/F \quad F \rightarrow (E)/id$.
b) Discuss in brief about Yacc. [5+5]

OR

5.a) Construct CLR Parsing table for the grammar $S \rightarrow L=R/R, L \rightarrow *R/id, R \rightarrow L$.
b) Define Ambiguous Grammar? Check whether the grammar $S \rightarrow aAB$ [5+5]
$A \rightarrow bC/cd, \quad C \rightarrow cd, B \rightarrow c/d$ is Ambiguous or not.

6.a) Explain in detail about Polymorphism.
b) Explain in brief about Heap Storage allocation strategy. [5+5]

OR

7.a) Construct an annotated parse tree for 9-5+2.
b) Explain in brief about equivalence of type expressions. [5+5]

8.a) Explain in brief about different Principal sources of optimization techniques with suitable examples.

b) Define Flow Graph? Explain how a given program can be converted in to flow graph.

[5+5]

OR

9.a) What is DAG? Construct DAG for the following Basic block.

D: = B*C; E:= A+B; B:=B+C; A:=E-D:

b) Explain how copy propagation can be done using data flow equation.   [5+5]

10. Explain in detail the procedure that eliminates global common sub expression.

[10]

OR

11.a) What are the object code forms? Explain the issues in code generation.

b) Explain about machine dependent code optimization.   [5+5]

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