Code No: 125AP

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, November/December - 2017
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)	What are the features of a Lexical analyser?	[2]
b)	Explain in brief about left most and right most derivations.	[3]
c)	Define Left recursive grammar.	[2]
d)	List out the rules for FIRST and Follow.	[3]
e)	What are the advantages of heap storage allocation?	[2]
f)	Define Type Equivalence.	[3]
g)	What is algebraic transformation?	[2]
h)	Write in brief about flow graphs.	[3]
i)	What are the forms of a target program?	[2]
j)	What is machine independent code optimization?	[3]

PART - B

(50 Marks)

2.a) Define Regular Expression? Write about the identity rules for regular expressions.
b) Discuss in brief about left Recursion and Left Factoring with examples. [5+5]

OR

3.a) Define Compiler. Explain in brief about the LEX compiler.
b) Construct FIRST and FOLLOW 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 following grammar.
$E \rightarrow E+T/T \quad T \rightarrow T*F/F \quad F \rightarrow (E)/id$.
b) Discuss in brief about error recovery strategies in Parsing. [5+5]

6.a) Explain in brief about Type checking and Type Conversion.
   b) Define Symbol table. Explain about the data structures used for Symbol table.   [5+5]

OR

7.a) Explain in brief about Stack Storage allocation strategy?
   b) Define activation record? Explain in brief about the fields in activation record.   [5+5]

8.   What is DAG? Construct DAG for the following Basic block?   [10]
     D:= B*C;   E:= A+B;   B:=B+C;   A:=E-D;

OR

9.   Explain how copy propagation can be done using data flow equation?   [10]

10. Define loop optimization? Describe in brief about the transformation on basic blocks.   [10]

OR

11.a) Explain reducible and non reducible flow graphs with examples.
    b) Discuss about Instruction Selection and Register allocation.   [5+5]

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