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**R15**

Code No: 125AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, November/December -2017

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**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.

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**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]

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**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. [5+5]
- b) Construct FIRST and FOLLOW for the Grammar:  
 $E \rightarrow E+T/T, T \rightarrow T*F/F, F \rightarrow (E)/id$  ?

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

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- 5.a) Construct CLR parsing table for the following grammar.  
 $E \rightarrow E+T/T, T \rightarrow T*F/F, F \rightarrow (E)/id$ .
- b) Discuss in brief about error recovery strategies in Parsing. [5+5]

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- 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

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- 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]

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- 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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