

9. Briefly explain :

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(a) How to generate Code from DAGs ? Briefly explain.

(b) What do you understand by the term leader ?
Write an algorithm to identify the basic blocks.

Roll No.

3452

**B. Tech. 5th Semester (CSE-Data Science)
Examination – December, 2022**

AUTOMATA THEORY & COMPILER DESIGN

Paper : PCC-DS-305-G

Time : Three hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question Number 1 is *compulsory*.

1. Describe the following :

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- (a) Explain the role of the lexical analyzer briefly.
- (b) What is regular expression ? Explain its various identity.
- (c) What is context-free grammar ? Explain with an example.

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- (d) What is symbol table ? Explain its content briefly.
- (e) Briefly explain the Code Generation Phase.
- (f) How pushdown automata is different from DFA ? Explain.

SECTION – A

- 2. (a) Describe the structure of the compiler with its phases with the help of an example. 10
- (b) Construct the NFA with epsilon moves for the regular expression $10^* + 1$. 5
- 3. (a) Explain Chomsky hierarchy of grammar with the help of a diagram. 8
- (b) What is the role of the parser ? Explain Predictive parsing with the help of an example. 7

SECTION – B

- 4. (a) What do you mean by three address code ? Convert the following statements into the Quadruple, Triple and Indirect triple representation : $(A + B) * (C - D * E)$. 10
- (b) Explain difference between Deterministic and Non-Deterministic PDA. 5

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- 5. (a) State & explain Halting Problem. 8
- (b) What is Turing machine ? What is its different variant ? Explain. 7

SECTION – C

- 6 (a) Explain various Storage Allocation Strategies in detail. 8
- (b) Describe Dynamics Storage Allocation Techniques. 7
- 7. What is Symbol Table ? Explain various data structures of the symbol table briefly. 15

SECTION – D

- 8. Write a short notes on the following : 15
- (a) Explain various types of optimizations with the help of examples.
- (b) Describe the flow graphs in optimization.
- (c) Various issues in the design of the code generator.
- (d) Peep-hole optimization.

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