



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 214429

Roll No.

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MCA
(SEM. IV) THEORY EXAM. 2014-15
COMPILER DESIGN

Time : 3 Hours]

[Total Marks : 100

Note : Attempt the questions as indicated.

Q1. Attempt any *four* questions from the following : 5x4=20

- (a) Discuss the role of compiler-writing tools. Describe various compiler writing tools.
- (b) Describe the technique used for reducing number of passes.
- (c) Discuss the role of Macros in programming language.
- (d) Describe the basic structure of compiler.

- (e) Define and differentiate between DFA and NFA with an example.
- (f) What is DAG? Discuss it.

Q2. Attempt any *two* questions from the following : 10x2=20

- (a) How lexical analyzer removes white spaces from source file? Explain the buffer input scheme for scanning the source program.
- (b) Explain about basic parsing techniques. What is top - down parsing? Explain in detail.
- (c) How is finite automata useful for lexical analysis? Show that the following regular expressions are same by constructing optimized DFA
- (i) $(a / b)^*$
- (ii) $(a^* / b)^*$
- (iii) $(a / b^*)^*$

Q3. Attempt any *two* questions from the following : 10x2=20

- (a) What do you understand by left factoring and how it is eliminated?

(b) Consider the following

$$E \rightarrow T + E / T$$

$$T \rightarrow V * T / V$$

$$V \rightarrow id$$

Write down the procedures for the non - terminals of the grammar to make a recursive descent parser.

(c) Discuss the role of data - flow analysis in detail.

Q4. Attempt any *two* questions from the following : 10x2=20

- (a) Discuss the important data structures which are used in implementing symbol table.
- (b) Explain the implementation of simple stack allocation scheme while on run-time administration.
- (c) Write short notes on the following : (Any *two*)
 - (i) Principle sources of optimization
 - (ii) Problems in code generation
 - (iii) Error recovery schemes

Q5. Attempt any *two* questions from the following : 10x2=20

(a) Explain the following in the organization of code optimizer :

(i) Control - flow analysis (ii) Data - flow analysis

(iii) Transformations

(b) What is activation record? Explain its organization. Also discuss various storage allocation strategies.

(c) Explain any *two* of the following in detail :

(i) Lexical phase errors (ii) Syntactic phase errors

(iii) Semantic phase errors.