Reg. No. : | | | | | | | | | | | |

# Z 6155

M.E. DEGREE EXAMINATION, MAY/JUNE 2008.

Second Semester

Computer Science and Engineering

CS 1653 — COMPILER DESIGN

(Regulation 2005)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the need for separation of analysis and synthesis phase?

2. Define Grammar and Language with an example for each one.

3. What is meant by sentence and sentential form?

4. Draw a finite state machine with input alphabet {0,1} which accepts any string having an odd no. of 1's and odd no. of 0's.

5. Define handle and handle pruning.

6. List the advantages and disadvantages of top-down passing.

7. Define back patching.

8. How the address of the element in an array can be found?

9. Optimize the following code

$t_1 = b$
$t_2 = c$
$t_3 = t_2 * 1000$
$t_4 = t_1 + t_3$
$a = t_4$.

10. What is meant by static and dynamic allocation?

## PART B — (5 × 16 = 80 marks)

11. (a) What are the different phases of a compiler? Explain each one. (16)

Or

(b) (i) Describe the various compiler construction tools. (8)

(ii) Discuss the role of symbol table and error handling routines in compiler. (8)

12. (a) Construct a NFA and convert it to DFA for the regular expression $(a^* \mid b^*)^*$. (16)

Or

(b) Discuss about optimization of DFA based pattern matches. (16)

13. (a) What is meant by bottom-up parsing? List the advantages and disadvantages of it. Perform bottom-up parsing to derive the given string. (Assume any grammar and input string of your choice.) (16)

Or

(b) Discuss about how a tool can be used to generate parsers. (16)

14. (a) Describe the translation scheme used for Boolean expressions. (16)

Or

(b) Translate the following assignment statement into

(i) quadruples

(ii) triples and

(iii) indirect triples $p = q * -r + q * -r$. (6 + 6 + 4)

15. (a) Describe the issues in code generations. How they can be rectified? Explain in detail with proper examples. (16)

Or

(b) What are the principal sources of code optimization? Discuss it with examples. (16)

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