

D 70544



FIRST SEMESTER M.TECH. DEGREE EXAMINATION JANUARY 2015

MCS 10 104—COMPILER DESIGN

Time : Three Hours

Maximum : 100 Marks

Answer any five questions choosing atleast one question from each module.

Module I

1. (a) What are the different phases of a compiler ? Explain in detail the process of compilation. Illustrate the output of each phase of compilation for the input :
$$X = (P + Q) * (P + Q) + (A/B) + (A/B).$$
 (15 marks)
(b) Discuss the issues involved in binding variable to storage locations and symbolic registers. (5 marks)
2. (a) What are the phases in execution of a procedure ? How the parameters are passed using registers and run time stack ? (15 marks)
(b) Describe the high level and low level intermediate code languages with its advantages. (5 marks)

Module II

3. (a) Discuss in detail about the approach that uses dominators for control flow analysis with example. (15 marks)
(b) Distinguish between flow sensitive and flow insensitive alias information. (5 marks)
4. (a) Explain the framework of structure based data flow analysis. (10 marks)
(b) Describe the dependency testing in detail. (10 marks)

Module III

5. (a) What is the need for redundancy elimination ? Discuss the redundancy elimination with example. (10 marks)
(b) Explain the different loop optimization techniques with example. (10 marks)
6. (a) Discuss any two procedure optimization techniques with example. (15 marks)
(b) Discuss code hoisting with example. (5 marks)

Module IV

7. (a) Discuss the different instruction scheduling policies in detail. (15 marks)
(b) Discuss the priority based graph colouring register allocation in detail. (5 marks)
8. (a) Explain the interprocedural dataflow analysis in detail. (15 marks)
(b) Discuss dead code elimination with example. (5 marks)

[5 × 20 = 100 marks]