



Sixth Semester B.E. Degree Examination, Feb./Mar. 2022
Compiler Design

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, selecting atleast TWO questions from each part.

PART – A

- 1 a. Explain various phases of compiler. Show the translation for an Assignment statement :
Position = initial + rate * 60 (10 Marks)
- b. Explain input buffering strategy, used in lexical analysis? Explain how sentinels are handled using buffers. (10 Marks)
- 2 a. What is left recursion and left factoring? Explain with an example. (06 Marks)
- b. Give a formal definition of a CFG. Design a CFG for a simple arithmetic expression. (06 Marks)
- c. Explain panic mode recover and global correction error recovery strategies. (08 Marks)
- 3 a. Given the grammar
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$
 - i) Compute FIRST and FOLLOW sets
 - ii) Construct the predictive parsing table
 - iii) Show the moves made by predictive parser on the input $id + id * id$. (10 Marks)
- b. What is handle and handle pruning? How they are used in the STACK implementation of shift-Reduce parser? Show the configurations of a shift-reduce-parser on input $id_1 * id_2$ for the grammar in Q.3a. (10 Marks)
- 4 a. Obtain a set of Canonical LR(0) items for the grammar :
 $S \rightarrow L = R \mid R$
 $L \rightarrow * R \mid id$
 $R \rightarrow L$ (08 Marks)
- b. Write an algorithm for constructing LALR parsing table. (08 Marks)
- c. Write a note on the parser generator – YACC. (04 Marks)

PART – B

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- 5 a. Explain the concept of syntax – directed definition. (04 Marks)
- b. i) Give a SDD for a simple desk calculator
ii) Construct annotated parse tree for the input string $3 * 5 + 4n$ (08 Marks)
- c. Write a postfix SDT for desk calculator and show parser stack implementation. (08 Marks)
- 6 a. Obtain the directed acyclic graph for the expression $a + a * (b - c) + (b - c) * d$ (06 Marks)
- b. Explain the following with example: i) Quadruples ii) Triples iii) Indirect triples. (06 Marks)
- c. Explain SDT of switch statement. (08 Marks)
- 7 a. With a neat diagram, explain the typical subdivision of runtime memory? (10 Marks)
- b. What is activation record? Explain structure and purpose of each field in the activation record. (06 Marks)
- c. Explain the performance metrics to be considered while designing a garbage collector. (04 Marks)
- 8 a. Discuss the issues in the design of code generator. (10 Marks)
- b. How register allocation and evolution order plays an important role in a code generation? (06 Marks)
- c. Define flow graph. How it is constructed? (04 Marks)
