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

Question Paper Code : 80450

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024

Sixth Semester

Computer Science and Engineering

CS 8602 – COMPILER DESIGN

(Common to: Computer Science and Business Systems)

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the role of lexical analyzer.

2. Define Lex.

3. Define Context Free Grammar.

4. Explain YACC.

5. What is synthesized and inherited attributes?

6. Explain syntax tree with an example.

7. Explain the issues in code generator.

8. Explain heap management.

9. Define DAG.

10. Explain peep–hole optimization.

PART B — (5 × 13 = 65 marks)

11. (a) Explain structure of a compiler. Illustrate the output of each phase of compilation for the input "a = (b + c) * (b + c) * 2" (13)

Or

(b) Construct minimized DFA for the regular expression (a|b) * abb (13)

12. (a) Consider the grammar (13)

$S \rightarrow aAd \mid bBd \mid aBe \mid bAe$

$A \rightarrow c$

$B \rightarrow c$

Construct LALR Parsing Table.

Or

(b) Consider the following expression grammar G.

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E) \mid id$

Construct the precedence graph. (13)

13. (a) Generate Three address code and apply back patching for the given expression (13)

If(a > 0 && b < 1 || c! = 0)

x = a + b +c ;

else x = 1;

Or

(b) Explain Type Checking in detail. (13)

14. (a) Generate Assembly code and its sequence for the given assignment statement x = (a – b) – (a + b + c) + (a – b – c) (13)

Or

(b) Explain storage organization in detail. (13)

15. (a) Generate three address statement and DAG for recursive factorial computation. (13)

Or

(b) Explain data-flow analysis of structured flow graph. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Consider the grammar

$S \rightarrow (L) \mid a$

$L \rightarrow L, S \mid S$

(i) Construct Predictive Parsing Table (12)

(ii) Is the grammar LL(1)? (3)

Or

(b) Construct SLR parsing for the string "id*id b id" for the grammar

$P \rightarrow SbP \mid SbS \mid S$

$S \rightarrow WbS \mid W$

$W \rightarrow L*W \mid L$

$L \rightarrow id$

(i) Construct SLR Parsing Table. (12)

(ii) Is this grammar SLR? If so, show the parsing for the string id*id b id. (3)