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10IS662

# Sixth Semester B.E. Degree Examination, June/July 2023
## Compiler Design

Time: 3 hrs. Max. Marks:100

***Note: Answer any FIVE full questions, selecting at least TWO questions from each part.***



### PART – A

1 a. Explain the differential phases of a compiler by considering the following statement as input $a = b + c * 60$ **(10 Marks)**

b. Explain the concept of input buffering in the lexical analysis phase of a compiler. **(06 Marks)**

c. Construct transition diagram to recognize the tokens given below:
(i) Identifiers (ii) Relational operators. **(04 Marks)**

2 a. Briefly explain the problems associated with top-down parser. **(12 Marks)**

b. Explain the role of the parser in compiler model. **(04 Marks)**

c. Explain error recovery strategies in parser. **(04 Marks)**

3 a. What is a shift reduce parser? Explain the conflict that may occur during shift reduce parsing. **(04 Marks)**

b. What is handle pruning? Explain with the help of the grammar $S \rightarrow SS + \mid SS* \mid a$ and input string aaa*a++. **(08 Marks)**

c. Give Bottom-up parsing for the strings 000111 and grammar $S \rightarrow 0S1 \mid 01$ and construct parse tree in each step of deviation. **(08 Marks)**

4 a. Construct SLR Parsing table for the following grammar :
$X \rightarrow Xb$
$X \rightarrow a$
and show the moves made by the parser on the input string abb. **(12 Marks)**

b. Construct LALR parsing table for the grammar,
$S \rightarrow CC$
$C \rightarrow aC / d$ **(08 Marks)**

### PART – B

5 a. Write a SDD for desktop calculator. **(04 Marks)**

b. Assume suitable SDD to construct a syntax tree for the expression $a - 4 + c$ and what are the steps involved in construction of that syntax tree. **(08 Marks)**

c. Construct annotated parse tree for 3*5 and write dependency graph for the constructed parse tree. **(08 Marks)**

6 a. Draw the syntax tree and DAG for the expression $(a * b) + (c - d) * (a * b) + b$. **(08 Marks)**

b. Represent the following assignment namely $a = b * - c + b * - c$; in its syntax tree form, three-address code, quadruples and triples representation. **(12 Marks)**

7 a. Discuss the general structure of activation record. **(08 Marks)**

b. What is meant by calling sequence and return sequence? List the calling sequence design principles. **(08 Marks)**

c. Write a note on garbage collection. **(04 Marks)**

8 a. List and briefly explain the design issues of a code generator. **(10 Marks)**

b. With example explain common sub-expression and dead code elimination methods. **(10 Marks)**

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