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Question Paper Code: AIT004



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Four Year B.Tech V Semester End Examinations (Regular) - November, 2018

Regulation: IARE – R16

COMPILER DESIGN

(Common to CSE | IT)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

- (a) What are the difficulties with generalized Top down Parsing?

 - Left Recursive grammar
 - Backtracking
 - Rejection of valid string
 - Error reporting

[7M]
- (b) Explain in detail about the phases of compiler and translate the statement while $A > B$ do $A = A + B$.

[7M]
- (a) How do you eliminate left recursion for a given grammar? Write the procedure to remove left recursion. Remove the left recursion for the given grammar: $A \rightarrow a|Ba$ $B \rightarrow b|Cb$
 $C \rightarrow c|Ac$

[7M]
- (b) What are the First and Follow sets for the following grammar? The start non-terminal is E. [7M]

$E \rightarrow A$

$E \rightarrow L$

$A \rightarrow n$

$A \rightarrow i$

$L \rightarrow (S)$

$S \rightarrow E, S$

$S \rightarrow E$

UNIT – II

- (a) Show that the following simplified if-then-else grammar is not LR(0)

$S \rightarrow ictS | ictSeS | a$

[7M]
- (b) Explain various types of bottom-up parsers with example. Write the steps to construct LR(0) parsing table

[7M]

4. (a) Find the SLR parsing table for the given grammar and parse the sentence $(a + b)^* c$ [7M]
 $E \rightarrow E + E / E * E / (E) / id.$

- (b) Explain the LR parsing algorithm with an example. [7M]

UNIT – III

5. (a) What is the role of semantic analysis in compiler construction? How do we fix the attributes to the grammar symbols representing the language construct? [7M]
(b) What is syntax tree? Draw the annotated parse-tree for the input $3*5+4n$. [7M]
6. (a) Generate intermediate code for the following code segment along with the required syntax directed translation scheme: [7M]
if (a > b)
x = a + b
else
x = a - b
Where a and x are of real and b of int type data
- (b) How do you implement syntax directed definitions? Explain intermediate form of source program with example. [7M]

UNIT – IV

7. (a) What is type checking? Explain type checking in compiler construction with a suitable example. [7M]
(b) What are various storage allocations in runtime environment? Discuss the features of stack memory allocation. [7M]
8. (a) What is the concept of activation record? List and explain all elements related to activation record. Also differentiate call by copy restore and call by name. [7M]
(b) Explain single hash table to implement symbol table. Also define scope rules for the process of implementation. [7M]

UNIT – V

9. (a) What is code optimization? Explain about various levels and types of optimizations. [7M]
(b) What are the good and bad outcomes of optimization? Explain with example. [7M]
10. (a) Write the simple code generation algorithm and generate the code for the statement $W := (A-B) + (A-C) + (A-C)$ [7M]
(b) Explain the three techniques for loop optimization with examples [7M]

