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10IS662

Sixth Semester B.E. Degree Examination, June/July 2017
Compiler Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer 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. Given the grammar
$E \rightarrow E + T / T$
$T \rightarrow T * F / F$
$F \rightarrow (E) / id$
(i) Make the necessary changes to make it suitable for LL(1) parsing.
(ii) Construct FIRST and FOLLOW sets.
(iii) Construct the predictive parsing table.
(iv) Show the moves made by the predictive parser on the input. **(12 Marks)**

b. What is Handle Pruning? Explain with an example. **(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. Briefly explain the concept of syntax directed definition with example. **(08 Marks)**

b. Define inherited and synthesized attributes. **(04 Marks)**

c. Give the syntax directed definition to process a variable declaration in C and construct dependency graph for input float x, y, z; **(08 Marks)**

6 a. Construct DAG for the expression.
$((x + y) - ((x + y) * (x - y))) + ((x + y) * (x - y))$
Give the sequence of steps for the same. **(08 Marks)**

b. Explain with examples quadruples, triples and indirect triples. **(12 Marks)**

7 a. What is an activation record? Explain all the fields in an activation record. **(08 Marks)**

b. Explain the following storage allocation strategies:
(i) Static allocation (ii) Heap allocation. **(12 Marks)**

8 a. Discuss the following terms:
(i) Basic blocks. (ii) Next-use information. (iii) Flow graph. **(10 Marks)**

b. Explain the following code optimization with example:
(i) Finding local common sub expression. (ii) Dead code elimination. **(10 Marks)**

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