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10CS63

Sixth Semester B.E. Degree Examination, Dec.2016/Jan.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 various phases of a compiler with the help of neat diagram. (08 Marks)
b. Write the transition diagram along with program code to recognize the token below.
i) Relop (relational operator) ii) Unsigned number (12 Marks)
- 2 a. Give the rules for constructing FIRST and FOLLOW sets. (08 Marks)
b. Construct the predictive parsing table by making necessary changes to the grammar given below and show the parsing of string
id + id * id (LL parsing)
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow (E) \mid id$ (12 Marks)
- 3 a. What is shift reduce parser? Explain its actions and conflicts by taking an example. (10 Marks)
b. Design SLR parser for the following grammar by computing LR(0) items and show the parsing of string ((a))
 $A \rightarrow (A) \mid a$ (10 Marks)
- 4 a. Construct CLR parser by finding LR(1) items for the following grammar
 $S \rightarrow AA$
 $A \rightarrow aA \mid b$ (12 Marks)
b. Construct LALR parser for the grammar of Q4(a) using LR(1) items. (08 Marks)

PART – B

- 5 a. Define inherited and synthesized attributes. Give examples. (06 Marks)
b. Give the SDD for simple desk Calculator and draw Annotated parse Tree for expression $(3+4) * (5+6)$. (10 Marks)
c. Define syntax directed definition for a simple type declaration. (04 Marks)
- 6 a. Construct DAG and three address code for the following expression :
 $a + a * (b - c) + (b - c) * d$ (08 Marks)
b. Explain the following with an example: i) Quadruples ii) Triples. (08 Marks)
c. Generate three address code to the following statement :
Switch (ch)
{
 case 1 : C = a + b ; break ;
 case 2 : C = a - b ; break ;
}

(04 Marks)

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- 7 a. With a neat diagram, describe the general structure of an activation record. (06 Marks)
b. Explain the strategies for reducing fragmentation in heap memory. (08 Marks)
c. Explain briefly the performance metrics to be considered while designing garbage collector. (06 Marks)
- 8 a. Discuss the various issues in the design of a code generator. (10 Marks)
b. For the following program segment :
for i = 1 to 10 do
for j = 1 to 10 do
a[i, j] = 0.0
for i = 1 to 10 to
a [i, j] = 1.0
Generate intermediate code and identify basic blocks. (10 Marks)

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