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_Sixth__ SEMESTER **B.Tech [IT]**

END SEMESTER EXAMINATION *May-2018*

IT-302 COMPILER DESIGN

Time: 3:00 Hours *Max. Marks : 40*

Note : Question 1 is mandatory
Answer any three questions from Q. 2 to Q. 6
Assume suitable missing data, if any.

Q.1 Answer the following with justification for your choice

a) For the C statement "wilhe (n>10).....", the type of error is- (lexical/syntactic or both?)
b) The grammar A→AA, A→num, A→id is not suitable for LL(1) parsers because.....
c) (True/False) The inherited attributes will be computed only if the SDD has synthesized attributes [Explain using an example)
d) The grammar S→B+A, A→id, B→num is ambiguous or unambiguous? And why?
e) The ith array element a[i] is translated to .....Choices: {a[0+i], a+i, a, i}, and why?

(2x5)

Q.2[a] What are the differences of a stack from a heap and express your opinion on the type of languages (static/dynamic) with examples, for which heap allocation is absolutely required.

[b] Explain Dead code elimination with an example of 3-address code and its conversion to target language.

(5+5)

Q.3[a] Using examples of your own, explain the terms 'left recursion' and 'shift-reduce conflict' and analyse what are the problems these two create in parsers.

[b] Construct the NDFAs for 1) Identifiers 2) Keywords 3) relop for lexical phase

(5+5)

Q.4 For the following grammar S→B+A, A→T, T→B-C, C→M, M→B*D, B→num, D→num

a) Construct the SDD for converting to postfix notation
b) Construct DAG for a sample string of the language including any two operators

(5+5)

Q.5 Given the grammar S→B+A, A→T, T→B-C, B→num, C→num construct the Syntax Directed Definition (SDD) and the annotated parse tree for the input string '3+2-1'. Compute the attribute **.value** (for instance **S.value**) for each node of this tree bottom-up. Construct the Directed Acyclic Graph (DAG) for this string.

(10)

Q.6 Explain with examples of each

a) L-attributed SDD vs S-attributed SDD
b) Quadruples vs Triples data structures

(5+5)