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END-SEMESTER EXAMINATION (DECEMBER-2015)

SEMESTER-V(SESSION-2015/16)

(B.Tech.)

Subject Code: CS0301

Duration: 3 Hours

Subject Name: Compiler Design

Max .Marks: 100

Instructions

- All Questions are compulsory.
- The Question paper consists of 2 sections –Parts A consists 10 questions of 2 marks each. Parts B consists 5 questions of 16 marks each.
- There is no overall choice. Only Part B questions include internal choice

PART-A

(2*10=20 Marks)

1. Differentiate interpreters and compilers.
2. What are parse trees?

3. Give an example of ambiguous grammar
4. What is top down parsing?
5. Define LL (1) grammar.
6. What are the advantages of using an intermediate language?
7. What is the role of code generator in a compiler?
8. What are the contents of activation record?
9. What are roles and tasks of a lexical analyzer?
10. What are different kinds of errors encountered during compilation?

PART-B

(16*5=80 Marks)

1. (A) What do you mean by compiler? Why we need Compiler? Explain.
(B) What do you mean by single pass assembler and two Pass assembler? Explain.

OR

- (A) What do you mean by linkers and loaders explain with Example in detail?
(B) Discuss about the cousins of the compiler

2. Explain the phases of the compiler in detail. Write down the output of each phase for the expression

$$a = b + c * 50.$$

OR

(A) Describe how various phases could be combined as a single pass in a compiler

(B) Discuss the compiler construction tools.

3. Show that the following grammar is ambiguous
 $S \rightarrow aSbS/bSaS$ for a sentence belonging to the above grammar:

(A) Draw the parse tree

(B) Construct the left-most and right-most derivations of "abab".

OR

(A) Discuss S attribute and L attribute with respect to SDD (Syntax design definition).

(B) Give SDTS (syntax directed translation scheme) for switch statement

4. (A) Explain LALR parsing, justify how it is efficient over SLR parsing

(B) What is the role of lexical analyzer? Explain the issues of a lexical analyzer

OR

(A) Explain the algorithm for constructing precedence functions with suitable example

(B) Explain shift-reduce parsing with stack implementation.

5. (A) What are the three storage allocation strategies? Explain each in detail.

(B) Construct the DAG for the following basic block

$d := b * c$

$e := a + b$

$b := b * c$

$a := e - d$

OR

(A) What are the code optimization techniques? Explain any in detail

(B) Explain the issues in the design of code generator.