Explain with an example.

(b) Explain different ways to implement symbol table.

(c) Explain how memory is allocated to the program at run time. What is the use of activation record? Explain different fields in the activation record.

(d) Differentiate between stack, static and heap allocation strategies.

Unit - V

5. (a) List four errors detected in loop optimization and code generation phases.

(b) What do you mean by loop optimization? Explain different loop optimization techniques.

(c) Write in detail the steps of code generation algorithm including the function 'getreg' with an example. Generate the three addresses code and target code of

$x := (a - b) + (a - c) + (a - c)$

(d) Explain in brief issues in the design the code generator.

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B. E. (Sixth Semester) Examination Nov.-Dec. 2019

(Old Scheme)

(Branch : CSE)

COMPILER DESIGN

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. The first part in each question is compulsory which is of 2 marks. Attempt any two parts from the rest three, each is of 7 marks.*

Unit - I

1. (a) Define tokens, patterns and lexemes.

(b) Differentiate between NFA and DFA. Construct minimum state DFA accepting the languages denoted by regular expression $ab(a+b) * b$.

(c) Explain in brief different phases of the compiler. How the following statement is processed in different phases.
Amount = amount + 50 * cost

(d) Write a lex program that recognizes relational operators, numbers and identifiers.

Unit - II

2. (a) What do you mean by viable prefixes?

(b) Write a yacc program that generates the parser, which checks the syntax of arithmetic expressions.

(c) Is the following grammar LL(1)? Design top down parsing procedures for the below grammar. Trace the moves made by the parser to recognize the string abba.

$S \rightarrow abSa \mid aaAb \mid b$

$A \rightarrow baAb \mid b$

(d) Construct the canonical LR parser for the grammar

$S \rightarrow cA \mid ccB$

$A \rightarrow cA \mid a$

$B \rightarrow ccB \mid b$

Unit - III

3. (a) Differentiate between synthesized and inherited attributes with an example.

(b) Construct syntax tree, DAG and three address code for the expression

$$a + a * (b - c) + (b - c) * d$$

(c) Write three address code, quadruples, triples and indirect triples for the expression

$$a + a * (b - c) + (b - c) * d$$

(d) Write the syntax directed definition for while statement. And translate the state following statement into three address code.

I = 0;

X = 0;

While (i < 10) x = x + i;

Unit - IV

4. (a) What do you mean by dangling reference?