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322612(22)

B. E. (Sixth Semester) Examination, 2020

(Old Scheme)

(Branch : CSE)

COMPILER DESIGN

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : In all questions part (a) is compulsory. In remaining part (b), (c) & (d). Attempt any two parts. Part (a) carry 2 marks & remaining parts (b), (c) & (d) each carries 7 marks.

Unit - I

1. (a) Draw different phases of compiler in detail.

   (b) Construct a transition diagram to :

   (i)   Identifiers

   (ii) Floating point numbers

(iii) C relational operators

(c) Compare NFA and DFA using Thompson's construction, construct finite automata for the regular expression $(a/b)^* abb(a/b)^*$.

(d) Explain the tools that are needed in compiler construction.

Unit - II

2. (a) Define augmented grammar.

(b) Write short note on :

(i) Canonical collection of LR(0) items

(ii) Closure operation

(iii) GOTO operation

(c) Is the given grammar is SLR(1) or not :

S → AaAb | BbBa

A → ∈

B → ∈

(d) Explain Y_{ACC} and LEX tools in detail.

Unit - III

3. (a) What is syntax free?

(b) Convert the following expression :

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

is to :

(i) Quadruple

(ii) Triples

(iii) Indirect Triples

(c) Write postfix notation of :

(i) $a*(b+c)-d/e$

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

(d) Write short notes on :

(i) Synthesized attributes

(ii) Inherited attributes

Unit - IV

4. (a) Define dynamic storage allocation.

(b) Explain in detail about allocation strategies.

(c) What is activation record? Explain different fields of activation record.

(d) Write short notes on the following :

    (i)   Symbol table

    (ii)   Dynamic storage allocation

Unit - V

5. (a) Explain in brief issues in the design of the code generator. Only draw the design.

(b) What is global data flow analysis? Explain with example.

(c) Explain in detail loop optimization.

(d) Write steps for code generation algorithm and using that generate code sequence for the expression :

$$a = (p+q) - ((r+s) - t)$$