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Roll No. :

322652(22)

B. E. (Sixth Semester) Examination, April-May 2021

(New Scheme)

(CSE Engg. Branch)

COMPILER DESIGN

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : Part (a) is compulsory for each question.

Solve any two from (b), (c) and (d). All questions carry equal marks.

Unit-I

1. (a) Define token, lexeme and pattern. 2
- (b) Draw the transition diagram of relational operator and identifiers and translate into code. 7

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- (c) Explain in brief different phases of the compiler.
How the following statement is processed in different phases?

Amount = Amount + 50 * Cost 7

- (d) Construct the minimum state DFA for the regular expression $(a/b)*a(a/b)$. 7

Unit-II

2. (a) Define operator grammar. 2

- (b) When the grammar is said to be LL (1) or LR (1)?
Eliminate left recursion and find first and follow for the following grammar. 7

$S \rightarrow (S)/a$

$L \rightarrow L, S | S$

- (c) Write a YACC program that generates the parser, which checks the syntax of arithmetic expressions. 7

- (d) Construct SLR parse table for the given dangling else grammar. 7

$S \rightarrow iEtSeS | iEtS | a$

$E \rightarrow b$

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Unit-III

3. (a) Differentiate between inherited and synthesized attributes. 2

- (b) Write three address code, quadruples, triples and indirect triples for the expression : 7

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

- (c) Using the given grammar, write the syntax directed definitions to evaluate an expression. Construct the annotated parse tree for the sentence $2 + 3 * 7$.

$E \rightarrow E + T / T$

$T \rightarrow T * F / F$

$F \rightarrow (E) / \text{num}$ 7

- (d) Write the translation scheme to translate Boolean expressions into three-address code. 7

Unit-IV

4. (a) When call by name is preferred than other parameter passing techniques? 2

- (b) Differentiate between stack, static and heap allocation strategies. 7

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- (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. 7
- (d) What is the use of symbol table? List the capabilities and the contents of the symbol table. 7

Unit-V

5. (a) Define the term flow graphs. 2
- (b) Write in detail the steps of code generation algorithm including the function 'getreg' with an example. 7
- (c) Explain in brief issues in the design the code generator. 7
- (d) Construct the DAG for the following basic blocks : 7

$$D = B * C$$

$$E = A + B$$

$$B = B * C$$

$$A = E - D$$