Printed Pages:02 **Sub Code: NCS603**

Paper Id: 110252 **Roll No.**

B.TECH.
(VI-SEMESTER) THEORY EXAMINATION 2017-18
COMPILER DESIGN

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. **2 x10 = 20**

a. What is Bootstrapping?
b. What is Code Generator?
c. What is YACC & LEX tools?
d. Define Regular Expression using suitable example.
e. Explain Error detection in Symbol Table.
f. Explain Back patching using suitable example.
g. What is DAG?
h. What is the difference between Syntax Analyzer & Symantec Analyzer?
i. What is Data Flow Analysis?
j. Explain the difference between Top Down Parsing & Bottom Up Parsing.

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a. What are the Phases and Passes of compiler? Explain the function of each Phases briefly.
b. Explain LR(0) parsing Algorithm using suitable example.
c. Define a SDT to generate Three Address Code.
d. What is role of Symbol Table? Discuss Data Structures used for Symbol Table.
e. Construct the DAG for the expression:
a+a*(b-c)+(b-c)*d+ e+e*(f-g)+(f-g)*h

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

(a) i) Remove left factoring of the following grammar:
S→aAB | aA | aAC
ii) Remove left Recursion of the following grammar:
S→Ab | B, A→Ac | Sb | ε

(b) i) Explain the role of precedence & associativity for the conversion of ambiguous grammar to unambiguous grammar.

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ii) Find out the FIRST() & FOLLOW() of the following grammar:

$S \rightarrow aBDh$
$B \rightarrow cC$
$C \rightarrow bC \mid \varepsilon$
$D \rightarrow EF$
$E \rightarrow g \mid \varepsilon$
$F \rightarrow f \mid \varepsilon$

P.T.O

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Check that the following grammar is LR(1) or LALR(1) or not by using their table:

$S \rightarrow Aa \mid bAc \mid Bc \mid bBa$
$A \rightarrow d$
$B \rightarrow d$

(b) Explain Recursive Descent Parsing using one suitable example. How it differ from Operator Precedence Parsing.

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) Consider the following three address code segment:

1. If $i \leq 10$ goto 3
2. goto 7
3. $t1 = j * 4$
4. $t2 = t1 + 10$
5. $a = t2$
6. $j = j + 1$
7. stop

find the basic block & flow graph of above sequence.

(b) Generate Three Address Code,Quadraple,Triple & Indirect Triple for the following statement: -(a+b)*(c+d)+(a+b+c)

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) What are lexical phase errors, syntactic phase errors & semantic phase errors? Explain with suitable example.

(b) Explain Storage allocation Strategies in Runtime Environment.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Explain different type of Loop Optimization Technique briefly.

(b) Write short note on :

i) Global Data Flow Analysis
ii) Peephole Optimization

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