

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:
 $S \rightarrow aAB \mid aA \mid aAC$
ii) Remove left Recursion of the following grammar:
 $S \rightarrow Ab \mid B, A \rightarrow Ac \mid Sb \mid \epsilon$
 - (b) i) Explain the role of precedence & associativity for the conversion of ambiguous grammar to unambiguous grammar.

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

$S \rightarrow aBDh$

$B \rightarrow cC$

$C \rightarrow bC \mid \epsilon$

$D \rightarrow EF$

$E \rightarrow g \mid \epsilon$

$F \rightarrow f \mid \epsilon$

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