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52 (5) CODG 5.1

**2016**

**COMPILER DESIGN**

Paper : 5.1

Full Marks : 60

Time : 2½ hours

***The figures in the margin indicate full marks for the questions.***

1. Define the following : 5×1=5
  - (a) Links
  - (b) Lander
  - ✓(c) Regular expression
  - (d) DAG
  - (e) Syntax Tree.
  
2. ✓ What is a compiler ? State the different phases of compiler. 1×5=5

Contd.

3. Write a regular expression to accept strings ending with  $ab$  over  $\{a, b\}$ . Also draw the NFA for the same.  $1 \times 5 = 5$

4. Construct the DFA for the regular expression  $a(a+b)^*.bb$ . Also minimize the DFA if necessary.  $1 + 10 = 10$

5. What is left factoring? Left factor the following grammar :  $1 \times 5 = 5$

$$S \rightarrow OEtS/iEtSeS/a$$

$$E \rightarrow b$$

6. Construct a LALR parsing table for the following grammar  $1 \times 10 = 10$

$$S \rightarrow CC$$

$$C \rightarrow cC/d$$

7. What is syntax directed definition? Explain synthesised and inherited attributes.  $1 \times 5 = 5$

8. What is a three address statement? List the common three address statements.  $1 \times 5 = 5$

**OR**

Explain syntax directed definition for flow of control statements.

9. Give the triple and quadruple representations for the following statements. 1×5=5

$$a := b * -C + b * -c$$

**OR**

State the principal sources of code optimization.

10. Generate the basic blocks for the following statements. 1×5=5

1.  $i := m - 1$
2.  $j := n$
3.  $t1 := 4 * n$
4.  $v := a[t1]$
5.  $i := i + 1$
6.  $t2 := 4 * n$
7.  $t3 := a[t2]$
8. if  $t3 < V$  goto 5
9.  $j := j - 1$
10.  $t4 := 4 * j$
11.  $t5 := a[t4]$
12. if  $i > j$  goto 15
13.  $t6 := 4 * i$
14.  $x := a[t6]$
15.  $t7 := 4 * i$