

VI-SEMESTER
END SEMESTER EXAMINATIONB.Tech.(CO)
May- 2019

CO-302 Compiler Design

Time: 3:00 Hours

Max. Marks: 40

Note: Attempt any five questions

Q.No. 1

- A. Construct SLR (1) parsing table and compute FIRST & FOLLOW for the following grammar: [6]

 $S \rightarrow xAy | xBy | xAz$ $A \rightarrow aS / q$ $B \rightarrow q$

- B. Eliminate Left recursion from following grammar [2]

 $S \rightarrow A$ $A \rightarrow Ad | Ae | aB | aC$ $B \rightarrow bBC | f$ $C \rightarrow g$

Q.No. 2

- A. Design predictive parsing table for the following grammar and differentiate between top down and bottom up parsing. [4]

 $S \rightarrow X$ $X \rightarrow aY | Xd$ $Y \rightarrow bYZ / f$ $Z \rightarrow g$ (where 'S' is start symbol)

- B. How LALR is different from CLR? explain and find canonical collection of sets of LR(1) items for following grammar [4]

 $S \rightarrow Aa | bAc | dc | bda$ $A \rightarrow d$

Q.No. 3

- Eliminate loop invariant computations and construct program flow graph for the following program fragment [8]

```

Fact(x) {
    int f=1;
    for(i=2; i<=x; i++)
        f=f*i
    return (f) }

```

Q.No. 4

A. Translate the following expression into three address instructions

$x := -y * (a+b)$

Also give quadruple and triple representation of the same? [4]

B. Generate three address code for the following program fragment [4]

```

while(x<y and u<v) do
    if x=1 then y=y+1
    else
        while x<=v do
            x=x+3

```

Q.No. 5

A. Write SDD for generating three address code for Boolean expressions with &&, || (OR) and ! Operators. [4]

B. What is DAG? Construct DAG for the expression [4]
 $((a + a) + (a + a)) + ((a + a) + (a + a))$

Q.No. 6

A. Explain the mid-square method and folding method used for generating hash values. [4]

B. Differentiate between common sub-expression elimination and dead code elimination with example and also discuss code motion with suitable example [4]

Q.No. 7

A. Explain error recovery strategies adopted by compiler. [4]

B. Explain following with suitable examples [4]

- a. Ambiguous grammar and cross compiler
- b. LEX and YACC