Code No: R05411904 **R05** **Set No. 2**

IV B.Tech I Semester Examinations,November 2010
AUTOMATA AND COMPILER DESIGN
Electronics And Computer Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Consider the following Context Free Grammar(CFG):
   E → I |E + E| |E*E| (E)
   I → a |b| Ia | Ib | I0 | I1
   Find the leftmost derivation, rightmost derivation, and parse tree for the string: a*(a+b00). [5+5+6]

2. Explain Linear bounded automaton with an Example? [16]

3. consider the following pascal code and draw the Activation Record.

```
Program param(input , output);
    Procedure b(function h(n: integer): integer );
        Var m : integer
        Begin m := 3;
        writeln(h(2))
        End {b};
    Procedure c:
        Var m : integer;
            Function f(n: integer) : integer ;
                Begin f := m + n
                End { f }
    Procedure r;
     Var m : integer;
     Begin m := 7;
          B(f)
     End { r }
Begin m := 0; r end { c };
Begin
C
End.
```

[16]

4. Generate code for the following C program [16]

```
Main( )
{
    int i;
    int a[10];
    while ( i <= 10 )
        a[i] = 0;
}
```

Code No: R05411904 **R05** **Set No. 2**

5. (a) Design a DFA for accepting the set of all strings of 0's and 1's that does NOT ends with the sub-string 00.
   (b) Let L = {∈} and L ⊆ {0, 1}*. Explain, how many states are presented in the minimal Finite Automata for L.
   (c) Construct an NFA equivalent to the Regular Expression: (0 + 1)* 1(0 + 1). [8+4+4]

6. Construct the SLR(1) parse table for the following grammar:
   S → 0S0 |1S1| 10. [16]

7. What is the limit flow graph? Is the flow graph shown in figure 2 reducible? Explain. [16]

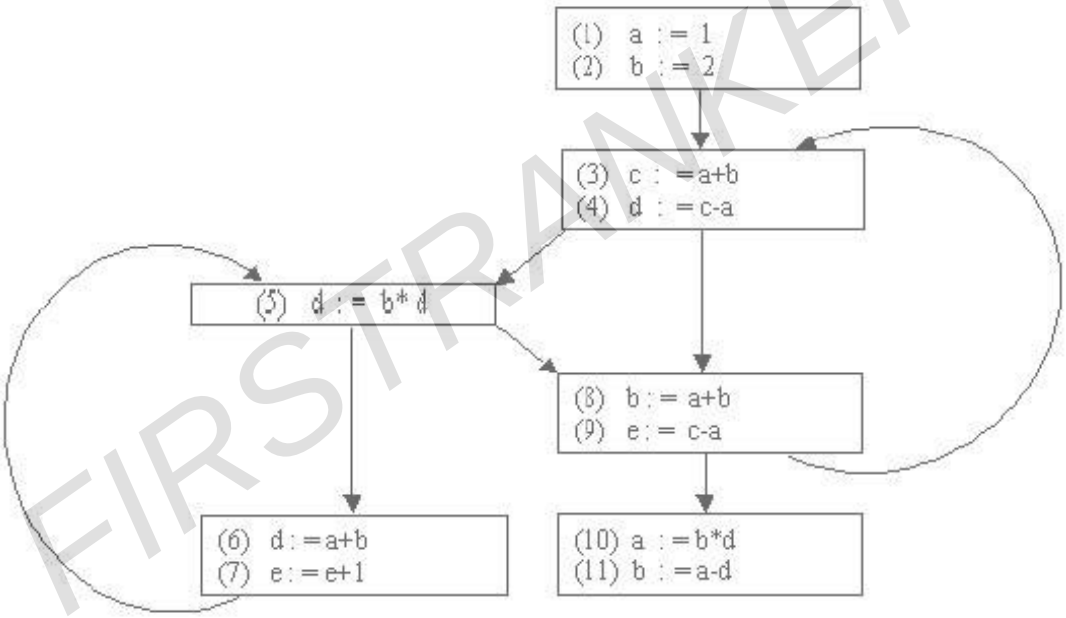

Figure 2

8. Consider the following grammar:
   D → TL;
   T → int |float
   L → L, id |id
   (a) Write the Syntax Directed Definitions to add the type of each identifier to its entry in the symbol table during semantic analysis.
   (b) Draw an annotated parse tree for the declaration: float id1, id2, id3; [8+8]

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Code No: R05411904 **R05** **Set No. 4**

IV B.Tech I Semester Examinations,November 2010
AUTOMATA AND COMPILER DESIGN
Electronics And Computer Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Consider the following grammar:
   D → TL;
   T → int |float
   L → L, id |id

   (a) Write the Syntax Directed Definitions to add the type of each identifier to its entry in the symbol table during semantic analysis.

   (b) Draw an annotated parse tree for the declaration: float id1, id2, id3; [8+8]

2. Construct the SLR(1) parse table for the following grammar:
   S → 0S0 |1S1| 10. [16]

3. Generate code for the following C program [16]

```
Main( )
{
        int i;
        int a[10];
        while ( i <= 10 )
                a[i] = 0;
}
```

4. What is the limit flow graph? Is the flow graph shown in figure 2 reducible? Explain. [16]

Code No: R05411904 **R05** **Set No. 4**

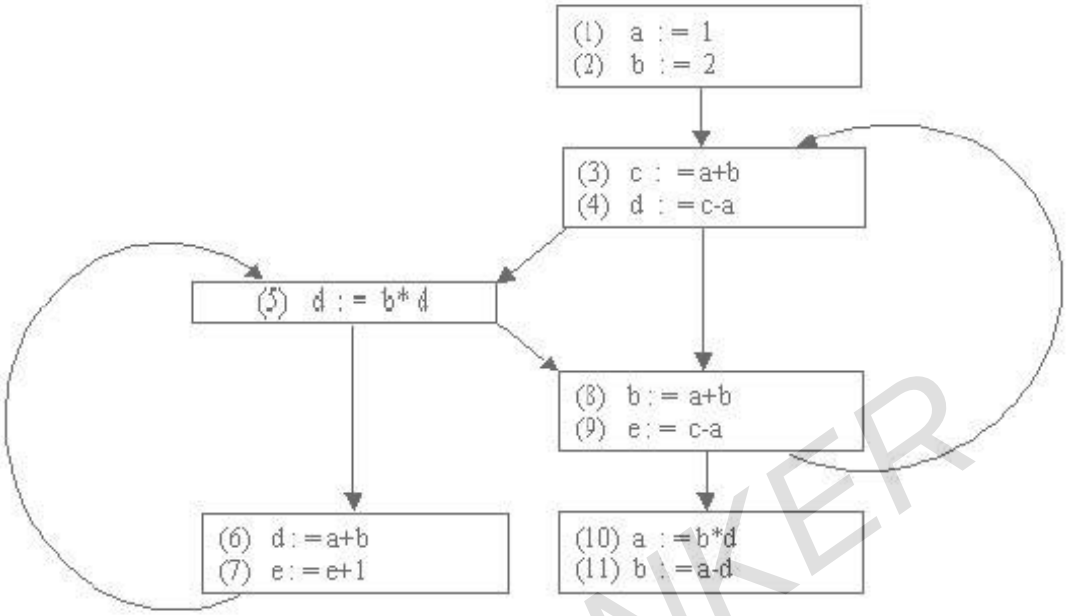

Figure 2

5. Explain Linear bounded automaton with an Example? [16]

6. Consider the following Context Free Grammar(CFG):
   $E \rightarrow I \,|E + E|\, |E^*E|\, (E)$
   $I \rightarrow a \,|b|\, Ia \,|\, Ib \,|\, I0 \,|\, I1$
   Find the leftmost derivation, rightmost derivation, and parse tree for the string: a*(a+b00). [5+5+6]

7. (a) Design a DFA for accepting the set of all strings of 0's and 1's that does NOT ends with the sub-string 00.
   (b) Let L = {∈} and L ⊆ {0, 1}*. Explain, how many states are presented in the minimal Finite Automata for L.
   (c) Construct an NFA equivalent to the Regular Expression: (0 + 1)* 1(0 + 1). [8+4+4]

8. consider the following pascal code and draw the Activation Record.

```
Program param(input , output);
    Procedure b(function h(n: integer): integer );
        Var m : integer
        Begin m := 3;
        writein(h(2))
        End {b};
    Procedure c:
        Var m : integer;
            Function f(n: integer) : integer ;
                Begin f := m + n
                End { f }
```

```
        Procedure r;
         Var m : integer;
         Begin m := 7;
               B(f)
         End { r }
Begin m := 0; r end { c };
Begin
C
End.
```

[16]

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Code No: R05411904 **R05** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
AUTOMATA AND COMPILER DESIGN
Electronics And Computer Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
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⋆ ⋆ ⋆ ⋆ ⋆

1. Explain Linear bounded automaton with an Example? [16]

2. consider the following pascal code and draw the Activation Record.

```
Program param(input , output);
    Procedure b(function h(n: integer): integer );
        Var m : integer
        Begin m := 3;
        writein(h(2))
        End {b};
    Procedure c:
        Var m : integer;
            Function f(n: integer) : integer ;
                Begin f := m + n
                End { f }
    Procedure r;
     Var m : integer;
     Begin m := 7;
          B(f)
     End { r }
Begin m := 0; r end { c };
Begin
C
End.
```

[16]

3. What is the limit flow graph? Is the flow graph shown in figure 2 reducible? Explain. [16]

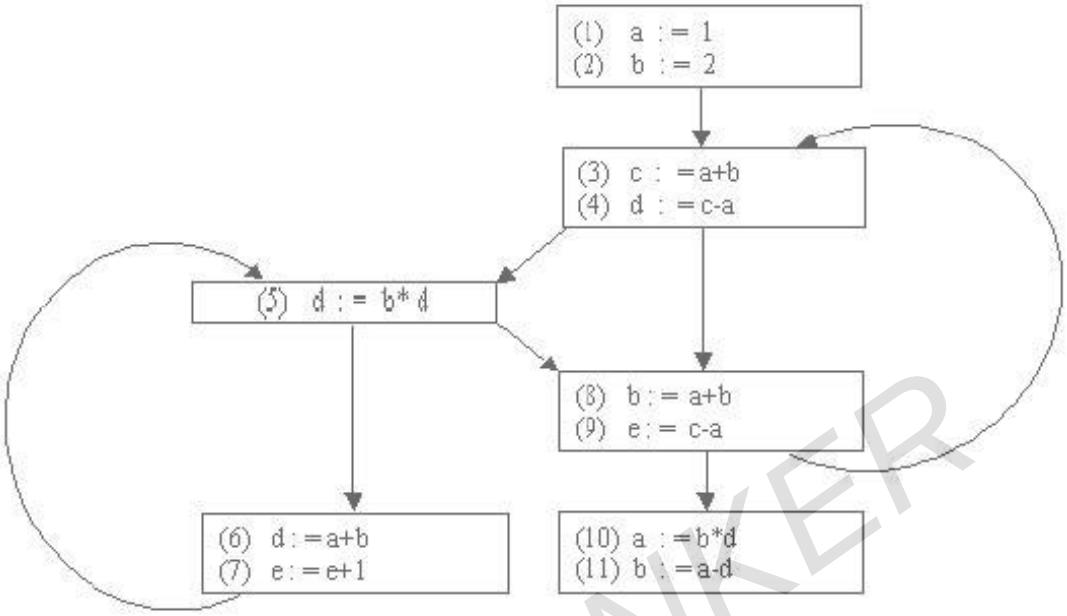

Figure 2

4. Construct the SLR(1) parse table for the following grammar:
   $S \rightarrow 0S0 \,|1S1|\, 10.$ [16]

5. Consider the following grammar:
   $D \rightarrow TL;$
   $T \rightarrow \text{int} \,|\text{float}$
   $L \rightarrow L, \text{id} \,|\text{id}$
   (a) Write the Syntax Directed Definitions to add the type of each identifier to its entry in the symbol table during semantic analysis.
   (b) Draw an annotated parse tree for the declaration: float id1, id2, id3; [8+8]

6. Generate code for the following C program [16]

```
Main( )
{
        int i;
        int a[10];
        while ( i <= 10 )
                a[i] = 0;
}
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7. Consider the following Context Free Grammar(CFG):
   $E \rightarrow I \,|E + E|\, |E^*E|\, (E)$
   $I \rightarrow a \,|b|\, Ia \,|\, Ib \,|\, I0 \,|\, I1$
   Find the leftmost derivation, rightmost derivation, and parse tree for the string: $a^*(a+b00)$. [5+5+6]

8. (a) Design a DFA for accepting the set of all strings of 0's and 1's that does NOT ends with the sub-string 00.

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(c) Construct an NFA equivalent to the Regular Expression: (0 + 1)* 1(0 + 1).

[8+4+4]

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Code No: R05411904 **R05** **Set No. 3**

IV B.Tech I Semester Examinations,November 2010
AUTOMATA AND COMPILER DESIGN
Electronics And Computer Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Consider the following Context Free Grammar(CFG):
   E → I |E + E| |E*E| (E)
   I → a |b| Ia | Ib | I0 | I1
   Find the leftmost derivation, rightmost derivation, and parse tree for the string: a*(a+b00). [5+5+6]

2. What is the limit flow graph? Is the flow graph shown in figure 2 reducible? Explain. [16]

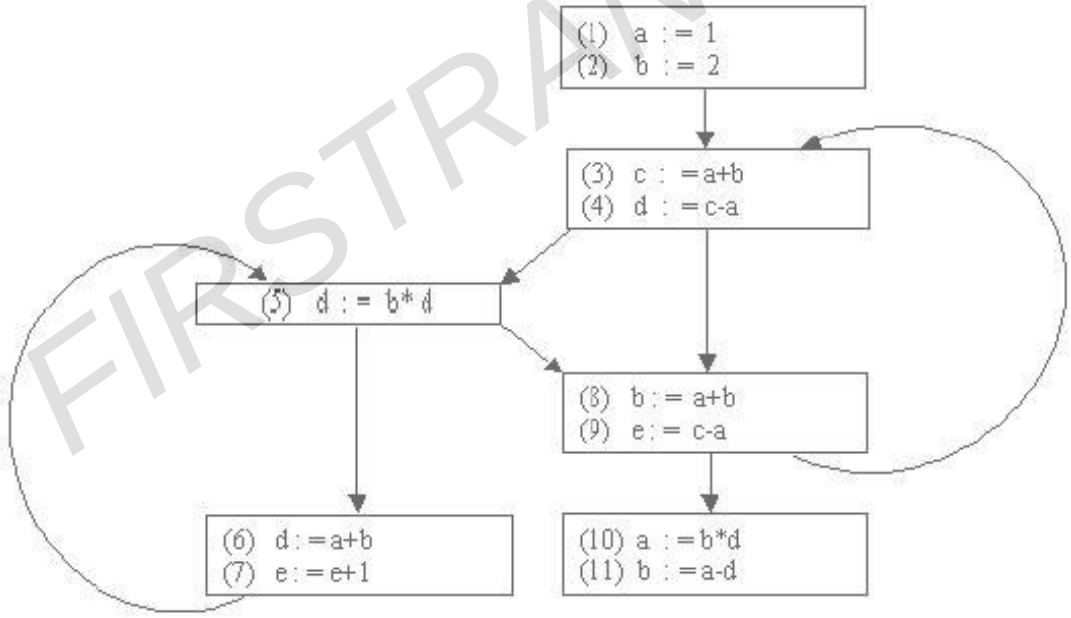

Figure 2

3. (a) Design a DFA for accepting the set of all strings of 0's and 1's that does NOT ends with the sub-string 00.
   (b) Let L = {∈} and L ⊆ {0, 1}*. Explain, how many states are presented in the minimal Finite Automata for L.
   (c) Construct an NFA equivalent to the Regular Expression: (0 + 1)* 1(0 + 1). [8+4+4]

4. Explain Linear bounded automaton with an Example? [16]

5. Consider the following grammar:
   D → TL;
   T → int |float
   L → L, id |id

   (a) Write the Syntax Directed Definitions to add the type of each identifier to its entry in the symbol table during semantic analysis.

   (b) Draw an annotated parse tree for the declaration: float id1, id2, id3; [8+8]

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   S → 0S0 |1S1| 10. [16]

7. consider the following pascal code and draw the Activation Record.

```
Program param(input , output);
    Procedure b(function h(n: integer): integer );
        Var m : integer
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            Begin f := m + n
            End { f }
    Procedure r;
    Var m : integer;
    Begin m := 7;
        B(f)
    End { r }
Begin m := 0; r end { c };
Begin
C
End.
```

[16]

8. Generate code for the following C program [16]

```
Main( )
{
    int i;
    int a[10];
    while ( i <= 10 )
        a[i] = 0;
}
```

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