Code.No: **R05310501**  |  R05  |  SET-1

### III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
### FORMAL LANGUAGES & AUTOMATA THEORY
### (COMPUTER SCIENCE AND ENGINEERING)

Time: 3hours                                             Max.Marks:80

**Answer any FIVE questions**
**All questions carry equal marks**
- - -

1.  Design DFA for the following over $\{0,1\}$.
    a) All string containing not more than three 0's.
    b) All strings that has at least two occurrences of 1 between any two occurrences
       of 0.                                                                    [8+8]

2.  Construct DFA for given Fig.1 NFA with $\in$-moves.                         [8+8]
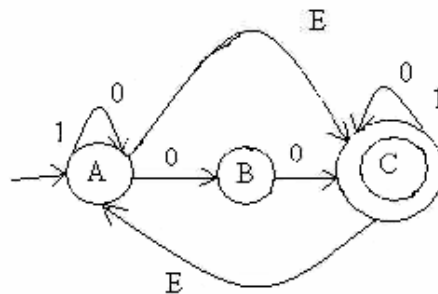


Fig.1

3.  Construct FA for the following regular expressions.
    a) $(0+1)^*(1+00)(0+1)^*$            b) $0+10^*+01^*0$.                      [8+8]

4.  Construct a FA for the following Right Linear Grammar (R.L.G) and write the
    conversion procedure?
    $$S \rightarrow 0A$$
    $$A \rightarrow 10A/\in.$$                                                  [16]

5.a)  Describe the language in English generated by C.F.G.
      $B \rightarrow b/B/aBB/BBa/BaB.$
  b)  Give a CFG for the even palindrome over the alphabet $\{0,1\}$ and design a
      pushdown automata for the same.                                          [6+10]

6.  Construct PDA's that recognizes the languages:
    a) $L1 = \{a^n b^n : n \geq 1\}$        b) $L2 = \{x \in \{a,b\}* : |x|_a = |x|_b\}$.   [16]

7.a)  What is delta of a Turing Machine, Explain functions involved in a move of
      Turing Machine in detail.
  b)  Design Turing Machine to accept even palindromes derived from the input $\{a,b\}$.
      Give its Transition table and diagram also.                              [8+8]

8.  Write short notes on:
    a) Recursive functions              b) Post machines
    c) Non regular languages            d) Decidable problem.                   [16]

**--ooOoo--**

Code.No: **R05310501**          R05          SET-2

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010**
**FORMAL LANGUAGES & AUTOMATA THEORY**
**(COMPUTER SCIENCE AND ENGINEERING)**

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

**Answer any FIVE questions**
**All questions carry equal marks**
**- - -**

1.     Construct FA for the following regular expressions.
       a) $(0+1)^*(1+00)(0+1)^*$                (b) $0+10^*+01^*0$.                [8+8]

2.     Construct a FA for the following Right Linear Grammar (R.L.G) and write the
       conversion procedure?
                    $S \rightarrow 0A$
                    $A \rightarrow 10A/\in$.                                                              [16]

3.a)   Describe the language in English generated by C.F.G.
       $B \rightarrow b/B/aBB/BBa/BaB$.
  b)   Give a CFG for the even palindrome over the alphabet {0,1} and design a
       pushdown automata for the same.                                              [6+10]

4.     Construct PDA's that recognizes the languages:
       a) $L1=\left\{a^n b^n : n \geq 1\right\}$                b) $L2=\left\{x \in \{a,b\}* : |x|_a = |x|_b\right\}$.     [16]

5.a)   What is delta of a Turing Machine, Explain functions involved in a move of
       Turing Machine in detail.
  b)   Design Turing Machine to accept even palindromes derived from the input {a,b}.
       Give its Transition table and diagram also.                                  [8+8]

6.     Write short notes on:
       a) Recursive functions                    b) Post machines
       c) Non regular languages                  d) Decidable problem.          [16]

7.     Design DFA for the following over {0,1}.
       a) All string containing not more than three 0's.
       b) All strings that has at least two occurrences of 1 between any two occurrences
          of 0.                                                                      [8+8]
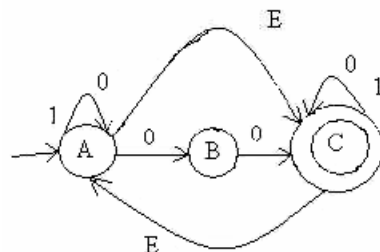
8.     Construct DFA for given Fig.1 NFA with $\in$-moves.                          [8+8]



Fig.1

**--ooOoo--**

Code.No: **R05310501**

R05

SET-3

### III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
### FORMAL LANGUAGES & AUTOMATA THEORY
### (COMPUTER SCIENCE AND ENGINEERING)

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

**Answer any FIVE questions**
**All questions carry equal marks**
**- - -**

1.a) Describe the language in English generated by C.F.G.
$B \rightarrow b / B / aBB / BBa / BaB$.

b) Give a CFG for the even palindrome over the alphabet {0,1} and design a pushdown automata for the same. [6+10]

2. Construct PDA's that recognizes the languages:
a) $L1 = \left\{a^n b^n : n \geq 1\right\}$          b) $L2 = \left\{x \in \{a,b\}* : |x|_a = |x|_b\right\}$. [16]

3.a) What is delta of a Turing Machine, Explain functions involved in a move of Turing Machine in detail.

b) Design Turing Machine to accept even palindromes derived from the input {a,b}. Give its Transition table and diagram also. [8+8]

4. Write short notes on:
a) Recursive functions                b) Post machines
c) Non regular languages            d) Decidable problem. [16]

5. Design DFA for the following over {0,1}.
a) All string containing not more than three 0's.
b) All strings that has at least two occurrences of 1 between any two occurrences of 0. [8+8]

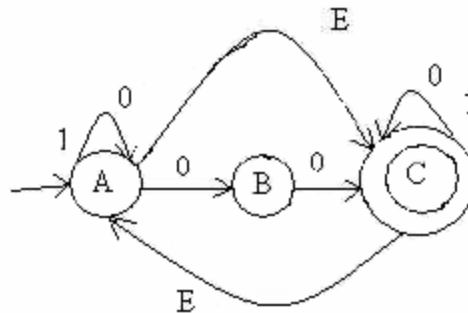6. Construct DFA for given Fig.1 NFA with $\in$-moves. [8+8]



Fig.1

7. Construct FA for the following regular expressions.
a) $(0+1)^* (1+00)(0+1)^*$            b) $0+10^* + 01^*0$. [8+8]

8. Construct a FA for the following Right Linear Grammar (R.L.G) and write the conversion procedure?
$S \rightarrow 0A$
$A \rightarrow 10A / \in$. [16]

**--ooOoo--**

Code.No: **R05310501**

R05

SET-4

**III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010**
**FORMAL LANGUAGES & AUTOMATA THEORY**
**(COMPUTER SCIENCE AND ENGINEERING)**

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

**Answer any FIVE questions**
**All questions carry equal marks**

**- - -**

1.a) What is delta of a Turing Machine, Explain functions involved in a move of Turing Machine in detail.
 b) Design Turing Machine to accept even palindromes derived from the input {a,b}. Give its Transition table and diagram also. [8+8]

2. Write short notes on:
 a) Recursive functions     b) Post machines
 c) Non regular languages    d) Decidable problem. [16]

3. Design DFA for the following over {0,1}.
 a) All string containing not more than three 0's.
 b) All strings that has at least two occurrences of 1 between any two occurrences of 0. [8+8]

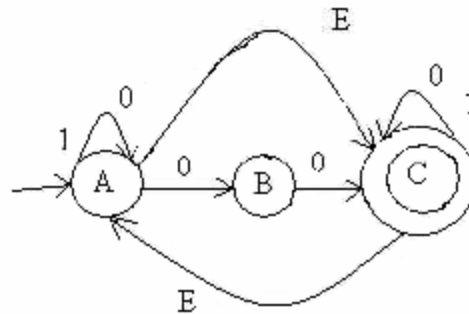4. Construct DFA for given Fig.1 NFA with $\in$-moves. [8+8]



Fig.1

5. Construct FA for the following regular expressions.
 a) $(0+1)^*(1+00)(0+1)^*$ b) $0+10^*+01^*0$. [8+8]

6. Construct a FA for the following Right Linear Grammar (R.L.G) and write the conversion procedure?
 $$S \rightarrow 0A$$
 $$A \rightarrow 10A / \in.$$ [16]

7.a) Describe the language in English generated by C.F.G.
 $B \rightarrow b / B / aBB / BBa / BaB$.
 b) Give a CFG for the even palindrome over the alphabet {0,1} and design a pushdown automata for the same. [6+10]

8. Construct PDA's that recognizes the languages:
 a) $L1 = \{a^n b^n : n \geq 1\}$ b) $L2 = \{x \in \{a,b\}* : |x|_a = |x|_b\}$. [16]

**--ooOoo--**