**United College of Engineering & Research, Prayagraj**

**Department of Computer Science & Engineering**

**Automata Theory(KCS-402)**

**Assignment-1**

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| **Q. No.** | **Question** | **CO** | **Bloom’s level** |
|  | **Section-A** |  |  |
| 1 | Define Alphabet and String in Automata Theory. | CO1 | L1 |
| 2 | Give the definition of Deterministic Finite Automata (DFA). | CO2 | L1 |
| 3 | For the given language L1 = ε, L2 = {a}, L3 = Ø. Compute L1 L2\* U L3\* . | CO1 | L2 |
| 4 | Design a FA to accept the string that always ends with 101. | CO2 | L2 |
| 5 | Design the DFA that accepts an even number of a’s and even number of b’s. | CO2 | L2 |
|  | **Section-B** |  |  |
| 6 | Give the complete description about the Chomsky’s Hierarchy. | CO1 | L2 |
| 7 | Minimize the following DFA:- | CO2 | L3 |
| 8 | Design FA for ternary number divisible by 5. | CO2 | L3 |
| 9 | Construct DFA which accepts all the strings of a and b, in which number of a is divisible by 3 and number of b is divisible by 5. | CO2 | L3 |
| 10 | Compute the epsilon-closure for the given NFA. Convert it into DFA. | CO2 | L3 |
| 11 | Let L1 be some language over ∑ and L2 = Ø. Then prove that  (a) L1.L2 ≠ L1  (b) L1+L2 ≠ Ø | CO1 | L2 |
| 12 | Construct a DFA accepting all strings over alphabet set ∑ = {0,1} that are ended with 00. | CO2 | L2 |
| 13 | Describe the language accepted by following finite automata:- | CO2 | L2 |
| 14 | Draw DFA of the following languages over {0, 1}?  (a) All strings with even number of 0’s and even number of 1’s.  (b) All strings of length at most 5. | CO2 | L3 |
| 15 | Draw DFA for the following over set ∑ = {0, 1}.  (a) L = { w ! |w| mode 3 = 0 }  (b) L = { w ! |w| mode 3 > 1 } | CO2 | L3 |

**CO** - Course Outcome

**Bloom’s Levels**

1- Remembering 2-Understanding 3-Applying

4-Analyzing 5-Evaluating 6-Creating