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

**Department of Computer Science & Engineering**

**Automata Theory(KCS-402)**

**Assignment-2**

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| **Q. No.** | **Question** | **CO** | **Bloom’s level** |
|  | **Section-A** |  |  |
| 1 | Explain in brief about the Kleen’s Theorem. | CO3 | L1 |
| 2 | State the pumping lemma theorem for regular languages. | CO3 | L1 |
| 3 | Write regular expression for set of all strings such that number of a’s divisible by 3 over Σ = {a,b}. | CO3 | L2 |
| 4 | Find regular expression for the set, L = {am bn ! m >1, n >2 and mn >7}. | CO3 | L2 |
| 5 | What do you mean by ε-Closure in FA? | CO3 | L1 |
|  | **Section-B** |  |  |
| 6 | Prove that the compliment, homomorphism, inverse homomorphism, and closure of a regular language is also regular. | CO3 | L2 |
| 7 | Explain Myhill-Nerode Theorem using suitable example. | CO3 | L2 |
| 8 | Prove that the language L={anbn ! n ≥1} is not regular language. | CO3 | L3 |
| 9 | Write regular expression for each of the following languages over the alphabet {a,b}:-  (a) The set of all strings in which every pair of adjacent 0’s appears before any pair of adjacent 1’s.  (b) The set of all strings not containing 101 as a substring. | CO3 | L3 |
| 10 | Design a NFA to recognize following set of strings 0101, 101 and 011. Alphabet set is {0, 1}. Find the equivalent regular expression. | CO3 | L2 |
| 11 | Find the regular expression corresponding to the finite automata given bellow: | CO3 | L3 |
| 12 | Show that L={ap ! p is prime) is not regular? | CO3 | L3 |
| 13 | For regular expression, prove that (a+b)\* ≠ a\*+b\*. | CO3 | L2 |
| 14 | Describe the language to the given regular expression:-  (1+01)\*(0+01)\* | CO3 | L2 |
| 15 | What is regular expression? Construct regular expression for the regular expression, (00+001)\*1. | CO3 | L3 |

**CO** - Course Outcome

**Bloom’s Levels**

1- Remembering 2-Understanding 3-Applying

4-Analyzing 5-Evaluating 6-Creating