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

**Department of Computer Science & Engineering**

**Assignment Paper, 2020-2021**

**Assignment No.: 3 Semester:** IV

**Course Name:** Automata Theory **Max. Marks:** 20

**AKTU Course Code:** KCS-402 **Last Date of Submission:** 20/June/2021

**Note:** All questions are **compulsory**.

**Section-A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ques. No.** | **Questions** | **CO** | **Bloom’s**  **level** | **Marks** |
| 1. | Define regular expression. | 3 | L1 | 1 |
| 2. | Find the regular expression of the following set  L = { w ! w ∈{a,b}\* and | w | mod 3 = 0 } | 3 | L3 | 1 |
| 3. | State Pumping lemma for regular languages. | 3 | L1 | 1 |
| 4. | Find the set represented by following regular expression  ((0 + 1)(0 + 1)\*)\*00(0 + 1)\* | 3 | L2 | 1 |

**Section-B**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ques. No.** | **Questions** | **CO** | **Bloom’s**  **level** | **Marks** |
| 5. | Explain Myhill-Nerode Theorem using suitable example. | 3 | L2 | 2 |
| 6. | Write a regular expression to denote a language L which accepts all the strings that begin or end with either 00 or 11. | 3 | L3 | 2 |
| 7. | Give the regular expression for set of all strings over 0,1 containing exactly three 0's. | 3 | L3 | 2 |
| 8. | State recursive definition of regular expression and construct regular expression corresponding to the following state transition diagram:- | 3 | L3 | 2 |

**Section-C**

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| --- | --- | --- | --- | --- |
| **Ques. No.** | **Questions** | **CO** | **Bloom’s**  **level** | **Marks** |
| 9. | Prove that the compliment, homomorphism and inverse homomorphism, closure of a regular language is regular. | 3 | L4 | 4 |
| 10. | Using pumping lemma, prove that the language  L = { ai2 ! i ⋝ 1 } is not regular. | 3 | L4 | 4 |

***P.T.O.***

**CO** - Course Outcome

**Bloom’s Levels**

1- Remembering 2-Understanding 3-Applying

4-Analyzing 5-Evaluating 6-Creating

Online Submission Link:

<https://forms.office.com/Pages/ResponsePage.aspx?id=iH1MhNPdS0m49BeImrlUVufKWOlnBY5Bpy0I8vHVaUpUQ1pERDdMMTI1UkpMSVlESDBBQ01ZSzY1Qy4u>