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| **Subject Name TAFL** | **Subject Code** | KCS-402 |
| **Date of Handover: 15/05/23** | **Max Marks** |  |
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**Practice Set-3**

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| **Q.no** | **Question** | **Mapped CO** |
|  | Write the regular expression for the following languages: **(2010-11)**   1. The set of all strings of 0’s and 1’s which ends with 1 and does not contain substring 00. 2. The set of all strings of 0’s and 1’s with an equal number of 0’s and 1’s such that no prefix has two more 0’s than 1’s nor two more 1’s than 0’s. 3. The set of all strings of 0’s and 1’s in which every 0 is followed by 11 4. The set of all strings of 0’s and 1’s in which the number of 0’s is even 5. Set of strings of 0’s and 1’s whose 5’th symbol from the left end is 1 6. The set of string {a, b, c} containing at least one a and at least one b 7. **L =** { **anbm : n>=4 and m <=3 }** 8. **L = { w: |w| mod 3 = 0}, w Є (a,b)\*** | **[CO2]** |
|  | i) Obtain the NFA **without epsilon** transition corresponding to the following regular expression:  **( 0\* + 1\*)\*11(1\*0\*)\* ,**  **00( 0\* + 1\*)\*11**  **ii)** Construct **Є-NFA** for regular expression (a + b)\*ab\* | **[CO2]** |
|  | Construct a FA/DFA accepting the following language  **i) a.b\*.c**  **ii) (a.b)\***  **iii) (a+b)\*.cd\*e**  **iv) (abc+de)\***  **v) (ab+c\*)\*b**  **vi)** **(010 + 00)\*(10)\*** | **[CO2]** |
|  | Let **r1** and **r2**  be two regular expressions defined as follows:  **r1 = (00\*1)\*1**  and  **r2 = 1 + 0(0 + 10)\*11**  Prove that **r1 = r2** | **[CO2]** |
|  | Find all the regular expressions **Rij(2)** for the following DFA **(2012-13)**     |  |  |  | | --- | --- | --- | | State/Input (Transition) | a | b | | 🡪q0 | q1 | q0 | | q1 | q1 | q2 | | \*q2 | q2 | q1 | | **[CO2]** |
|  | Prove the statement “If **L = L(A)** for some DFA **A**, the there is a regular expression **Rij(k)** such that **L = L(Rijk)**” by Induction method. | **[CO2]** |
|  | Obtain the regular expression for the following finite automata having q0 and q2 as final state     |  |  |  | | --- | --- | --- | | State/Input (Transition) | a | b | | 🡪\*q0 | q0 | q1 | | q1 | q0 | q2 | | \*q2 | q0 | q1 | | **[CO2]** |
|  | Prove the Kleen’s theorem i.e. Prove that every language defined by a regular expression is also accepted by some finite automata | **[CO2]** |
|  | show that (PQ)\*P = P(QP)\* | **[CO2]** |
|  | Determine the regular expression accepted by the following FA   1. **Using Arden’s theorem**   **a)**    **b)**     1. **Using Iterative Method** | **[CO2]** |