DEPARTMENT OF

**INFORMATION SCIENCE & ENGINEERING**

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| Date | 4th June 2021 | Maximum Marks | 50 |
| Course Code | 18IS46 | Duration | 120 Min |
| Sem | IV Semester | Closed Book Online Test-1 | |
| **THEORY OF COMPUTATION** | | | |

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| **Sl. No.** | **Questions** | **M** | **BT** | **CO** |
| 1.a | List the steps to convert regular grammar into finite automata.  Convert the following grammar using the same.  S → 0A | 1B | 0 | 1  A → 0S | 1B | 1  B → 0A | 1S | 04 | L1 | CO3 |
| 1.b | Convert the below grammar to CNF form: | 06 | L3 | CO3 |
| 2.a | State Pumping Lemma for Regular Languages. By using P.L, Prove that L = { wwR | w (0+1)\*} is not regular. | 06 | L5 | CO1 |
| 2.b | Check whether the following grammar is ambiguous. Prove your answer.  S → aB | bA  A → aS | bAA | a  B → bS | aBB | b | 04 | L3 | CO3 |
| 3.a | Convert the following ε-NFA to its equivalent DFA | 07 | L3 | CO1 |
| 3.b | Left factor the following grammar:  S → bSSaaS | bSSaSb | bSb | a  S → aSSbS | aSaSb | abb | b | 03 | L3 | CO3 |
| 4.a | Define left linear grammar and Obtain the same for the given DFA: | 05 | L3 | CO3 |

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| 4.b | Find a string of minimum length in {a,b}\* NOT in the language a\*b\*(ba)\*a\* | 02 | L1 | CO3 |
| 4.c | Define left recursion. Eliminate left recursion from the following grammar: | 03 | L3 | CO3 |
| 5.a | Write a short note on decision properties of regular languages. | 04 | L2 | CO1 |
| 5.b | Define useless variables. In each case, given the context free grammar G, find an equivalent CFG with no useless variables. | 06 | L3 | CO3 |

BT-Blooms Taxonomy, CO-Course Outcomes, M-Marks

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| Marks Distribution | Particulars | | CO1 | CO2 | CO3 | CO4 | L1 | L2 | L3 | L4 | L5 | L6 |
| Test | Max Marks | 17 | -- | 33 | -- | 4 | 34 | -- | -- | 6 | -- |

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