DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

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| Date | 23-01-2025 | Maximum Marks | 50 |
| Course Code | 2 | Duration | 2 hours |
| Sem | IV | Improvement CIE | No |
| UG/PG | UG | Faculty: | Naman |
| Course Title | TOC |  |  |

# Part- A

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Questions | M | BT | CO |
| 1 | Solve using this formula | 2 | 5 | 2 |
| 2 | Define DPDA. | 2 | 4 | 1 |
| 3 | Define left recursion. Eliminate left recursion from the following grammar S(L) | a, LL,S | S | 2 | 4 | 2 |
| 4 | Let G be the CFG and let “L” denotes the number of left most derivations, “R” denotes the number of right most derivations and “P” denotes thenumber of parse trees. Assume L, R, P are computed for a particular string. For a given CFG G and a string w, what is the relation between L, R, P (userelational operators)? | 2 | 4 | 3 |
| 5 | Find context-free grammars for the languages L={{a Nb m : n ≠ 2m}. | 2 | 1 | 3 |

# Part- B

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| --- | --- | --- | --- | --- |
| Q. No. | Questions | M | BT | CO |
| 1 | Discuss the applications of CFGs | 6 | 1 | 5 |
| 2 | Solve using this formula | 4 | 5 | 2 |
| 3 | Show that CFL’s are not closed under intersection and complementation | 6 | 4 | 3 |
| 4 | Consider the following undirected weighted graph. Find minimum spanning tree for the same using Kruskal’s algorithm. | 5 | 1 | 3 |
| 5 | Show that CFL’s are closed under union, concatenation and Kleene closure. | 4 | 4 | 1 |

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BT-Blooms Taxonomy, CO-Course Outcomes

Total Marks: 35